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DOS WORLD

DOS

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The Essential Guide to DOS and Windows

JULY 1996 • Number 28

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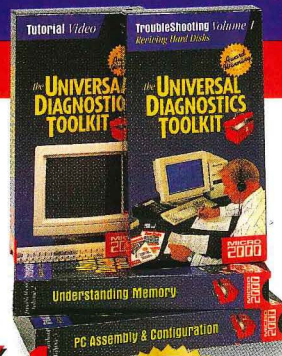
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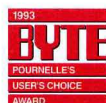
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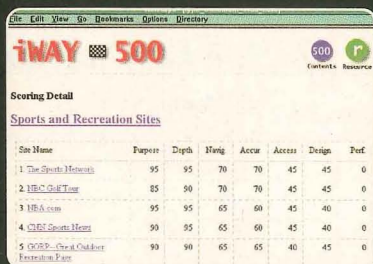
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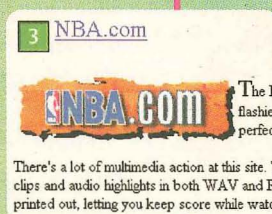
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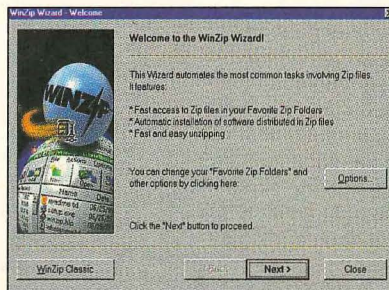
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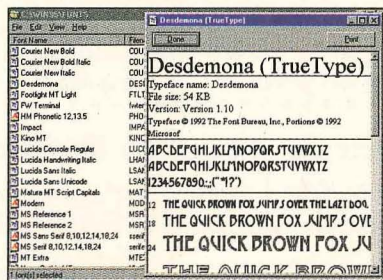
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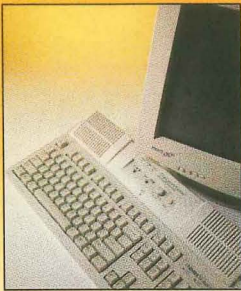
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Cover photo by Larry Dunn.

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Doug Lowe

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Jeff DeTray

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- **Mindscape releases *Angel Devoid: Face of the Enemy*, a new DOS-based interactive thriller on CD-ROM. Cop instinct and fast reflexes are the key to solving the mystery in this hard-boiled, futuristic shoot-'em-up.**
- **If you're a budding composer who likes the convenience of computerized notation—but you don't want to give up your acoustic instrument for it—check out Wildcat Canyon's *Autoscore* for Windows.**
- **Everybody learns better by doing—especially novice Web surfers. That's the principle behind APTE's *Internet Coach for Netscape Navigator*, developed originally for the Clinton White House crew. Internet simulations and resource modules make it a plus for newbies and old hands alike.**
- **What do you get when you cross a mouse with a trackball? A brand-new critter called *Felix*, that's what. A unique ergonomic design ensures that you flex only your fingers, not your wrist; optical tracking eliminates dust and grit.**
- **Plus innovative utilities and a wealth of new references and updates for your PC bookshelf.**

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DOS reserves a number of device names for its own use, so they're hands-off when it comes to naming your batch files. DOS may even wipe out a hapless file that crosses the line.

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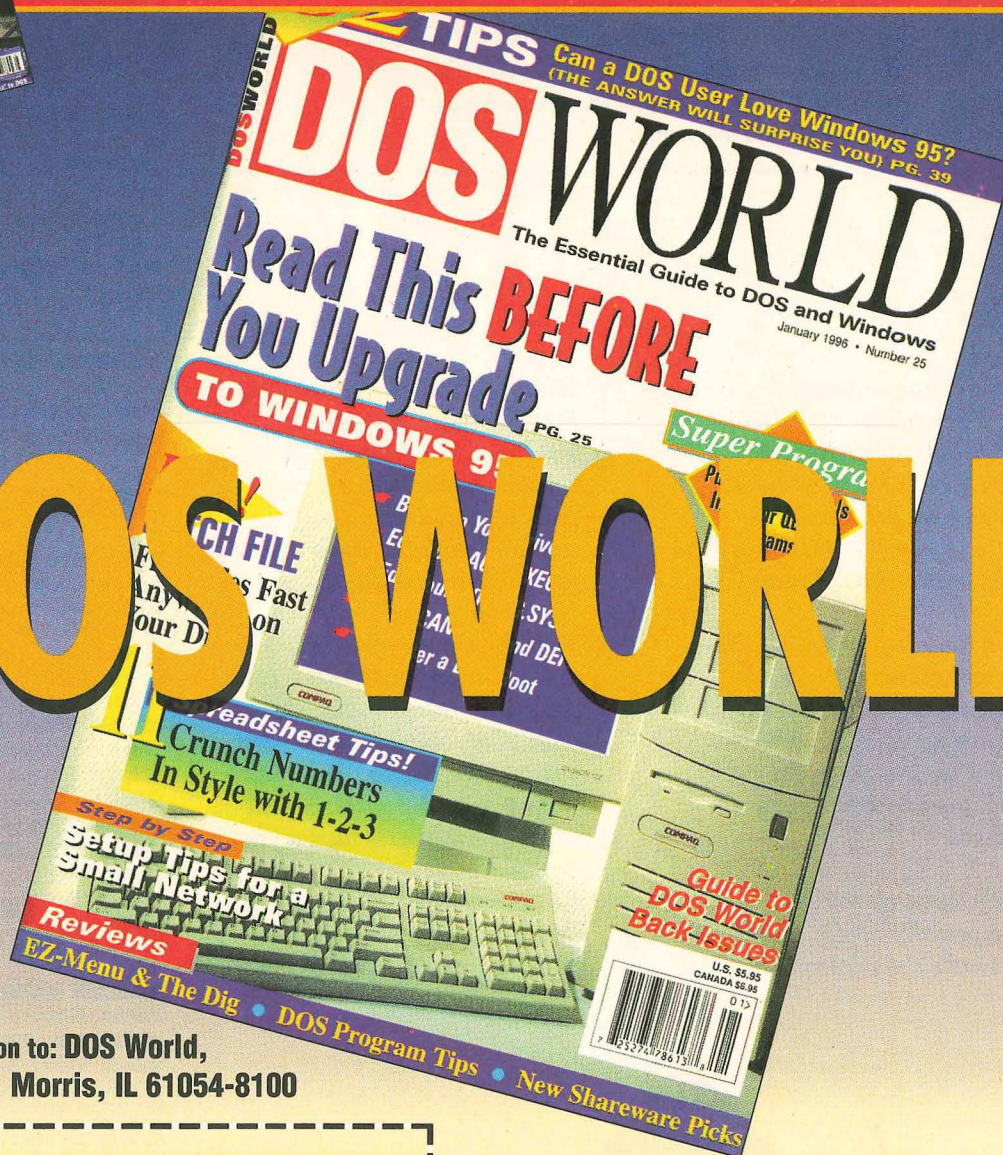
U.S. subscription rate \$24.97, one year; \$46.00, two years; Canada (including GST) and Mexico, \$29.70; foreign surface, \$41.70, one year; foreign air mail, \$53.70, one year. Payable in U.S. funds drawn on a U.S. bank. Prepayment required on all foreign subscriptions. Second-class postage is paid at Peterborough, NH, and additional offices. POSTMASTER: Send address changes to *DOS World*, P.O. Box 669, Mount Morris, IL 61054. CPC Int'l Pub. Mail #0500542.

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Our easy-to-understand articles are written by the country's top DOS authorities: Hardin Brothers, Rob Hummel, Doug Lowe, and Dan Gookin. We welcome your contributions, too. Each bimonthly issue of DOS WORLD includes plenty of hints, tips, and ideas from our readers.

So join us for every issue. Whether you love DOS or hate it, you'll find something to like in every issue of DOS WORLD. Subscribe now!

Letters to the Editor

The Copy Dilemma

Two of your columnists indicated [in the March 1996 *DOS World*, #26] that Microsoft is now overpacking high-density disks to save space and eliminate copying, and that backup copies of Microsoft programs are available from the company for \$5 per disk. [See page 71 in the "Q&A" section and "Copy/Format Sensation," page 23 in "Shareware Exchange."]

Although I don't condone piracy, as a consumer I believe that when you pay out your hard-earned cash, you should receive fair value. To cripple software used by legitimate buyers, or to tender software that's easily corrupted or has a minimal shelf life because of high-density magnetic methodology, is unconscionable. So is asking a paid-up customer to pay again for a backup when that backup disk is just as flawed as the original.

The technology to protect the software industry's interests is already here. CD-ROMs aren't copied easily. They're not easily corrupted, they have a longer lifespan, and they're easier to reinstall. As a security officer and consultant, I think that the best way for the software industry to protect its interests is to monitor the purchase of high-speed duplication equipment, by working with the manufacturers of such equipment to track buyers having larcenous intentions. From an ethical standpoint, this would be preferable to selling customers crippled software they can't back up. Ethics and trust are important parts of any business relationship; if your reporting is accurate, I believe that

Microsoft will lose a great many customers who aren't about to pay more for backup disks.

I always insist that my clients purchase software entirely on CD-ROM. Floppy drives, in my opinion, are obsolete and have no role in today's technology. From a security standpoint, floppies are a weakness; in corporate systems, such drives are an open invitation to violate computer integrity. The only magnetic medium a computer needs is the workspace: the hard drive.

Consumers should remember how much they pay for commercial software and that we're entitled to a degree of permanence. The failure of software magnates to learn the lessons of the 1970s relating to copy-protection issues should serve as a challenge to *DOS World* to remind them that consumers aren't fools. We pay good money for products and we expect full value for it. If we don't get value, we go elsewhere or simply refuse to buy.

*Lt. Col. Cliff Anchor
Monte Rio, California*

The Upgrade Debate

Shame on Doug Lowe for implying that no new versions of DOS programs are hitting the marketplace ["Q&A," *DOS World* #25, January 1996, page 60]. He specifically mentions WordPerfect, which has just introduced WordPerfect version 6.1 for DOS. The company also upgraded version 5.0 to 5.1+ for DOS, between the introduction of 6.0 and the arrival of 6.1 for DOS, for machines such as 8086es, 286es, and 386es with limited memory. I'm certain other com-

panies must still be upgrading their programs for DOS.

DOS World would serve its audience better by promoting such DOS programs instead of blindly following the crowd into the la-la land of Windows 95, which requires megabytes of RAM and super speeds. Will this year's version be Win96, requiring gigabytes of RAM and running on 686 machines at 900MHz? My guess is that 90 percent of the computer users in the world can do all they want or need to do with no more than a 50MHz 386. You should encourage programmers to continue to offer good software that uses less memory and works well with DOS, instead of misinforming them.

*Leon F. McClellan
CompuServe*

DOS Loyalty

Regarding a question in the "Q&A" department in the March 1996 *DOS World* [#26, page 71], Doug Lowe is correct in noting that IBM also uses an extended-density format. He should have pointed out, however, that IBM offers a way to copy these disks via the XDFCOPY command in PC DOS 7. Anyone hooked on DOS would do well to take a look at IBM's PC DOS 7, as it's a very powerful operating system with many useful extras.

I'd also like to note that in my experience, those of us who like DOS do have a viable alternative to Microsoft in IBM's OS/2 Warp. I recently purchased a new computer preloaded with Windows 95 and found that it wasn't an operating system with which I was comfortable; I felt that it took too much

How to Contact The Editors

DOS World welcomes letters, complaints, and submissions from readers. The easiest way to reach the editors is the U.S. mail: DOS World, 86 Elm St., Peterborough, NH 03458. All letters to the editor and questions are understood to be submitted for publication unless otherwise indicated. You can also reach our staff electronically over CompuServe at 75300,2357 or the Internet at 75300.2357@compuserve.com. Please include your complete address and a daytime phone number on your correspondence.

In addition, you can reach the editors through the DW bulletin-board system (603-924-3181). To connect, set your modem and software to 8 data bits, no parity, 1 stop bit. DW's BBS lists all the QBasic and shareware programs mentioned in these pages. Shareware items listed on the DW BBS are products protected by copyright law. You're welcome to try these programs. If you find them useful, we ask you to register and pay the applicable fees to the programs' respective owners.

DW encourages the submission of DOS tips and batch-file articles from readers. Please submit all material on disk in ASCII format together with a double-spaced printed copy to our offices. The magazine cannot be responsible for the return of these manuscripts, unless an appropriate mailer and return postage are enclosed.

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control from me. I went back to my old PC DOS 7 and Windows for Workgroups. I subsequently decided to try Warp and discovered, to my delight, that it performed a fast, flawless installation on my Acer Aspire, correctly identified and installed all my components, and gave me more control over my programs than I could imagine.

I did find that Warp, like Win95, requires 16MB of RAM to function satisfactorily. But Warp isn't at all the predatory system that Win95 is. From the folks with whom I've come in contact, it seems that more of us have decided to not use Windows 95 than to switch to it. I suspect that the bulk of Win95 users are people who bought new systems with Windows 95 already preinstalled, rather than people who upgraded to Win95 and kept it.

Bob Laudig

Watha, North Carolina

CORRECTIONS AND UPDATES

Keeping Track of Investments

An error appears in the pricing information for the product Insider TA in the March 1996 "DOS Watch" department (#26, page 80). This version of the package is actually priced at \$49 plus \$6.95 shipping. The latest version, released this past May, is priced at \$69 plus shipping. Insider TA Pro, a new version for serious traders, is priced at \$139 plus shipping. For more information, contact Stock Blocks Inc. at 800-697-1617.

Give MemMaker Some Help

Re the DOS tip appearing in your November 1995 issue, #24, page 13: How do I get MEMMAKER.STS into my editor? I searched my \DOS directory, but couldn't find it.

Perry Shuford Jr.
Chino, California

MEMMAKER.STS is stored in the same directory as MEMMAKER.EXE. According to Microsoft's TechNet MS-DOS

Resource Kit, here's the scoop: When you run MemMaker, it creates a MEMMAKER.STS file, containing information about the current state of the optimization process, your memory configuration, and the sizes of memory-resident programs. MemMaker creates the STS file just before it restarts your computer for the first time. It stores the file in the same directory as MEMMAKER.EXE. Normally, you don't need to edit the MEMMAKER.STS file; it exists mainly for MemMaker's use. MEMMAKER.EXE is usually found in the \DOS directory, but if your copy is located somewhere else (perhaps in your hard drive's root directory), that's where MEMMAKER.STS will be, too.

—Ken Johnson

Contributors

for July 1996

Lenny Bailes (page 45) is a free-lance writer, consultant, and teacher in San Francisco.

Contributing Editor and columnist **Hardin Brothers** (pages 10, 17, 40, 51, and 57) has been writing about computers for 15 years.

Contributing Editor **Robert L. Hummel** (page 62) is an engineer, consultant, and free-lance writer. He's the author of *PC Magazine Programmer's Technical Reference: The Processor and Coprocessor, Data and Fax Communications, and PC Magazine Assembly Language Lab Notes* (Ziff-Davis Press).

Eric Maloney (pages 14 and 22) is an editorial director of *DOS World*.

John E. Simpson (page 30) is a computer programmer and the author of *Crossed Wires*, a mystery novel about the online world.

Tips from Readers

You Are Here

Whenever you take advantage of DOS's multiple-configuration capabilities, it's often helpful to know which configuration your computer is using at the moment. I keep track of my whereabouts with the variable %CONFIG%, which DOS sets up for use in AUTOEXEC.BAT. The trick is to place this variable in your AUTOEXEC.BAT file's PROMPT statement.

For example, if you include this line in AUTOEXEC.BAT:

```
PROMPT %CONFIG%$_P$G
```

your prompt will look like this if you're in the configuration called Main:

```
Main
C:\DOS>
```

The dollar sign followed by an underline character tells DOS to issue a line feed/carriage return.

*Stuart Johnson
CompuServe*

Command Performance

If you have DOS version 6.2 or later, you can type the following line to load a new copy of COMMAND.COM along with a batch file you want to debug:

```
COMMAND /Y /C filename.BAT
```

You can then step through the specified batch file line by line, pressing Y to execute the line and N to skip it. The /C switch tells DOS to shut down the secondary copy of COMMAND.COM after you finish stepping through the batch file.

You can press the key combination Ctrl+C to end your batch-file debugging session at any time.

Unfortunately, though, the above command isn't perfect. If your batch file stores information in the environment and you haven't reserved enough space there, you'll get an "Out of environment space" message. DOS won't be able to store your data.

To avoid problems of this sort, I created this two-line batch file called CMD.BAT:

```
@ECHO OFF
COMMAND /E:1024 /Y /C %1 %2 %3 %4
%5 %6 %7 %8 %9
```

The /E switch loads COMMAND.COM with an environment size of 1024 bytes, which should be sufficient under most circumstances. The parameters, such as %1 and %2, let you load any batch file as well as any parameters it uses.

For example, to start CMD.BAT and load a batch file called TESTIT.BAT, you'd type this command at the DOS prompt:

CMD TESTIT

If you're wondering how much environment space you're using, you can run the accompanying short QBasic program ENV.BAS (below) to find out.

*Paul Smale
DOS World BBS*

Getting to the Root of Things

When I purchased my computer, I thought a 240MB hard drive would be sufficient, but I was wrong, so I added a 450MB drive. That cured my storage problem, but one thing annoyed me: Moving from a deeply nested subdirectory to the top of the directory structure of the other drive required typing a couple of backslashes. I solved the problem with the following DOSKEY macro:

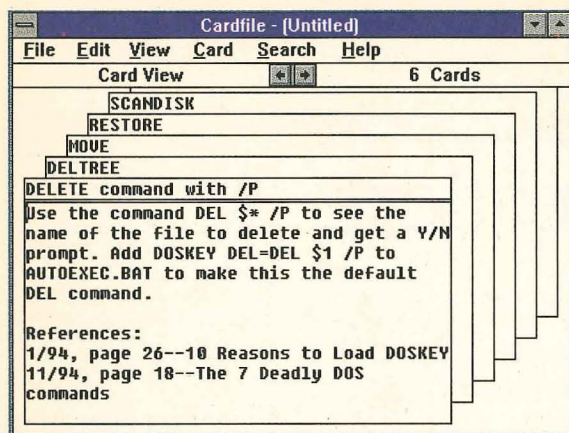
```
DOSKEY TOP=CD\ $T $1: $T CD\ $T CLS
```

Now if I'm in a sub-subdirectory on drive C and I want to get to the root directory on drive D, I can simply type TOP D and press Enter. If I'm in a sub-subdirectory on

The QBasic program ENV.BAS tells you how much environment space your system is using.

```
DO
  CNT%=CNT%+1
  JNK$=ENVIRON$(CNT%)
  IF JNK$>" " THEN
    SIZE%=LEN(JNK$)+1
    '* Add 1 for a string terminator character*
    PRINT JNK$; SIZE%
    USED%=USED+SIZE%
  END IF
LOOP UNTIL JNK$=""
PRINT:PRINT "Total environment used is"; USED%; "bytes."
END
```

End



You can use Windows' Cardfile to create a database of PC tips and tricks.

drive D and I want to get to the top of drive C, I type TOP C. To get to the root directory of drive C or D when I'm logged onto that drive already, I simply type TOP.

My macro contains four commands separated by the marker \$T. The first CD\ command moves you to the root directory of the current drive. The variable \$1 in the second command lets you follow the command to start the macro, TOP, with a parameter, such as C or D. If you supply a drive letter as a parameter, DOS changes to that drive and executes the second CD\, which moves you to the root of that drive. If you don't provide a parameter, DOS leaves you in the root directory of the current drive. Finally, the CLS command neatens things up by clearing the screen.

Linton Thomason
Jacksonville, Florida

Cardfile Catalog

I read every copy of your magazine from cover to cover. Although I try to remember the information in each issue, my memory tends to be short. I use Windows' Cardfile applet to help my recall; I jot down important tidbits and include references to articles touching on that topic. [See the accompanying screen shot, above.] Cardfile keeps my notes accessible and in alphabetical order.

Alan Tardif
Berlin, New Hampshire

Faking Out File Manager

I've found a way to copy the contents of a floppy disk in drive A to another floppy disk in drive A, without leaving Windows.

First, start File Manager (it's in the Main program group) and create a subdirectory for use as a file-transfer station. You can call it anything you like, but I named mine OTEMP (the

first character is a zero) so that it would reside right below the root directory.

Next, you're going to fool File Manager into thinking that this new directory is a drive. Look at the drive bar; if your computer has one floppy drive and a hard drive, you'll see icons for drives A and C. You'll add an icon for drive D.

Choose File/Run and type SYS-EDIT in the box. Conveniently, the system file you want to edit, AUTOEXEC.BAT, will be on top. To turn C:\OTEMP into a virtual drive, add this command to AUTOEXEC.BAT:

```
SUBST D: C:\OTEMP
```

Now choose File/Save. Shut down Windows safely and reboot your system. When you restart Windows and load File Manager, you should see your "new drive" listed among the items on the drive bar.

Whenever you want to copy from one floppy in drive A to another floppy in drive A, make sure that C:\OTEMP is empty. Then log onto drive A by double-clicking on its drive-bar icon.

Drag the root directory, A:\, from the drive window's left pane and drop it onto the drive D icon in the drive bar. To confirm that the copy operation went smoothly, double-click on the drive D icon and check the directory's contents.

Remove the first floppy disk from drive A and put in the other floppy disk. Double-click on the drive-bar icon for drive D; then drag D:\ from the directory window's left pane and drop it onto the drive-bar icon for A.

Bob Gromer
Grover Beach, California

Order, Order

In a recent issue, John Libby provided a tip advising readers to use DEFRAG to erase recently deleted files permanently ["Tips from Readers," *DOS World* #22, July 1995, page 8]. He recommended using this command:

```
DEFRAG /F /H /S
```

I don't think that including the /S switch is such a good idea, because it tells DEFRAG to sort files from small to large. Usually, you can shorten future defragmenting sessions if you sort from large to small instead.

Typically, the largest files on your hard disk are EXE files. Ordinarily these files don't change and so don't become fragmented. Placing them at the beginning of the sort order reduces the amount of relocation DEFRAG will have to do. Place small files, which change more frequently and therefore are more likely to become fragmented, at the tail end of the sort order.

Tom Nadeau
DOS World BBS

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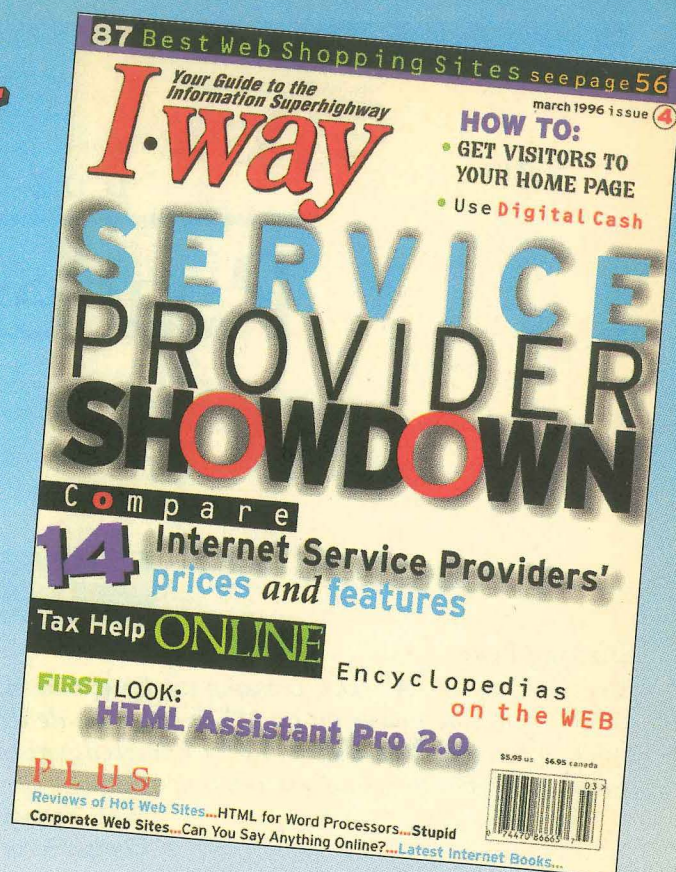
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by Hardin Brothers

Starting Over

Are pressing Ctrl+Alt+Del, pressing the Reset button, and turning the power on and then off equivalent? Over the years, I've asked many knowledgeable computer people; half said yes and half said no.

Walt Varner
CompuServe

No, these three techniques aren't the same at all. When you restart your computer by pressing Ctrl+Alt+Del, it performs a *warm boot*. The computer resets itself and then reloads your operating system. It doesn't clear memory, nor does it necessarily reset sound boards and other accessory cards plugged into your computer's bus. This is the fastest kind of reboot, but it

does the least-thorough job of resetting your computer. Because Ctrl+Alt+Del is a software-based reboot and software can intercept or even disable the reboot signal, it's the only kind of reboot that gives a disk-caching program such as SmartDrive or VCache or other memory-resident software a chance to shut down safely.

When you press the Reset button, the computer goes through a hardware boot, also called a *cold boot*. After initializing itself, your computer performs its power-on self-test, or POST, to make sure all its vital parts are working properly. On most PCs, a cold boot also initiates a quick RAM test, which has the effect of deleting anything that might be in memory. Your

computer then reloads and prepares your operating system. During a cold boot, the computer also sends a reboot signal to each accessory card installed in the system. The signal is a cue to the cards that they should reinitialize themselves. Sometimes, however, cards ignore this signal. That's where the third booting alternative comes in.

When you turn off your computer and then restart it, you can be sure that everything is completely reset. (To prevent damaging components that take a few seconds to discharge, leave the machine off for at least 15 seconds before turning it back on.) When you turn on a PC, the CPU (central processing unit) goes through the same steps it does during a cold boot. There's one important difference, how-

ever: This type of cold boot ensures that your various accessory cards are reinitialized.

Are the differences among these three kinds of booting important? If you use disk-caching software that caches (delays) writes, the most efficient kind, you should press Ctrl+Alt+Del to reboot or wait five seconds or more before pressing the Reset button. That will give your cache time to write its buffers to disk.

If your computer is locked up and pressing Ctrl+Alt+Del has no effect, try the Reset button. Only rarely will it fail to reboot your computer. If you're having a problem with an accessory card, however, you may have to shut down the power and then turn

I once had a video board that forgot letter shapes—my DOS screens looked as though they were written in Martian. Sometimes the only way to fix a problem is to turn the power off and then on again.

your computer back on. I once had a video board that slowly forgot the shape of each letter when I ran a specific program. After a few minutes, my DOS screens looked as though they were written in Martian. The only way I could fix things was to turn off the computer for at least 15 seconds and then turn it back on.

Command Performance

I use DOS's ANSI.SYS program and the PROMPT command to assign commands to my function keys, but I can't find a way to assign commands to any function key higher than F10. The key number for F10 is 68, so I assumed that F11 would be 69 and F12 would be 70, but that doesn't work. Can you give me the values for function keys F11 through F24? What values should I use when combining these keys with the Shift, Alt, and Ctrl keys?

*Richard Bonner
Dartmouth, Nova Scotia
Canada*

Exactly how and why are the numerical keys on the keypad and the numerical keys at the top of the keyboard different? When I use key combinations involving the Alt key—Alt+255, for example—the keypad keys seem to work, but the number keys above the letter keys don't.

*Roger C. Gledhill
Ann Arbor, Michigan*

Each time you press or release a key, the keyboard sends a code to the computer to tell it which key went up or down. Unless you're running a program such as Windows, which interprets the keys for itself, the computer's BIOS receives each keyboard code and sends a code to DOS or a running program.

The code the BIOS generates and passes on has two parts: a key number and an ASCII value. Most programs look only at the ASCII value. Some programs, however, make a distinction between the numbers on the keypad and those above the letter keys. They can do that because, even though those keys have the same ASCII values, they have different key numbers. When you hold down Alt while pressing a one-, two-, or three-digit number on the numeric keypad, the BIOS translates the result into a single ASCII value and pretends that you pressed a key of that value.

Not every key has an ASCII value, however. For example, neither the function keys—by themselves or in conjunction with Shift, Ctrl, and Alt—nor the cursor keys have ASCII values. When you press one

of these non-ASCII keys, the BIOS reports an ASCII value of zero plus a key number. Many programs, including ANSI.SYS, which lets you assign commands to keys, read both numbers if the ASCII value is zero.

FUNCTION-KEY VALUES

Key	Code	Shift+key	Ctrl+key	Alt+key
F1	0;59	0;84	0;94	0;104
F2	0;60	0;85	0;95	0;105
F3	0;61	0;86	0;96	0;106
F4	0;62	0;87	0;97	0;107
F5	0;63	0;88	0;98	0;108
F6	0;64	0;89	0;99	0;109
F7	0;65	0;90	0;100	0;110
F8	0;66	0;91	0;101	0;111
F9	0;67	0;92	0;102	0;112
F10	0;68	0;93	0;103	0;113
F11	0;133	0;135	0;137	0;139
F12	0;134	0;136	0;138	0;140

The accompanying table (above) shows the usual values for function keys F1 through F12. As you can see, the codes for F11 and F12 don't follow the same progression as the other keys. That's because the original PC keyboard had only ten function keys. F11 and F12 were added when 80286-based systems were introduced, and those keys were given the next set of codes that hadn't already been assigned.

The keys F13 through F24 on your keyboard aren't part of a standard PC keyboard. To find the codes for them, you can type in and run the accompanying short QBasic program, KEYVAL.BAS (below). This

KEYVAL.BAS is a QBasic program that reports the code for most keys. To use it, run the program and press the key whose value you want to know.

```
CLS
LP:
DO
    A$ = INKEY$
    LOOP UNTIL LEN(A$) > 0
    FOR I = 1 TO LEN(A$)
        PRINT ASC(MID$(A$, I, 1)); " ";
    NEXT I
    IF A$ = CHR$(27) THEN END
    GOTO LP
```

End

program prints either the ASCII value or zero plus the key number for any key you press. It stops when you press the Esc key. When you run this program, you'll discover that some key combinations (for example, Ctrl+Alt+another key) don't have unique values at all. Only programs that take over keyboard control for the entire computer can recognize those combinations. You can use any value or values this program reports to define ANSI.SYS command macros. You also can use them in your QBasic programs or in other programs.

Maximizing Memory

We've read that you can load only one program in the high-memory area [HMA] at a time. By default, DOS loads high the first program that requests it, no matter how small the program. Our question is this: How do you load a program into the HMA? If we can force a program to load there and still have enough space for DOS (43K, we think), won't this free up more conventional memory?

Michael Arndt
Michael Messier
Internet

DOS and DOS programs can use the HMA, a 64K block of memory just above the 1MB mark, because a fluke that surfaced in the 80286 processor was carried over to the 386, 486, and Pentium chips. The HMA is available on all such computers that have at least 64K bytes of extended memory. Most do.

Although the HMA is the first 64K segment of memory above the 1MB mark, the CPU fluke can also make the HMA appear to be in the real-mode memory area—the lower 640K that DOS and DOS programs normally use. When you use HIMEM.SYS as your memory handler, only one program can use the HMA. Usually, that one program is DOS itself, which loads

its kernel into the HMA when you use the DOS=HIGH command in your CONFIG.SYS file. If you specify DOS=LOW, you'll have less conventional memory, but the HMA will be available for another program.

Although most programs can use upper memory blocks (UMBs), only a few specially written programs can take advantage of the HMA. So the real question is this: Should you let DOS reside in the HMA or should you reserve it for another program?

DOS 5 wasted part of the HMA when it was installed high. DOS 6.x does a better job of utilizing the full 64K. So, normally, you're better off putting DOS high and then optimizing upper-memory blocks and other parts of RAM.

If DOS isn't loaded into the HMA, another program may ask to use it. If it does, that program will have exclusive use of the HMA. I've heard claims that Windows 3.1 can make better use of the HMA than DOS and that your system will therefore run slightly faster if you keep DOS low and let Windows take over the HMA. I'm inclined to believe that was more true under DOS 5 than under DOS 6.x.

You may encounter claims from developers of other software that their programs make more-efficient use of the HMA than DOS does. To find out whether such claims are true, you'll have to experiment and see what arrangement gives you the most speed and the most free conventional memory.

Resurrecting a Hard Drive

A couple of weeks ago, my CMOS battery died. If I'd saved the CMOS settings, everything would be fine, but I hadn't done so. After I replaced the battery, I guessed at the settings for my 133MB hard drive. I eventually chose type 32 with 1023 cylinders, 15 heads, and 17 sectors, which add up to 128MB. I found I had to boot from a floppy disk, though, and then access drive C.

Eventually, I got tired of booting from a floppy disk, so I decided to reformat the drive; then I loaded DOS back onto it. I still get an error, but I can press F1 and boot from the hard drive. When I ran CHKDSK, though, it reported about 2.5MB of bad sectors that had never been there before.

My battery is shot, and I think I trashed my hard drive! Where did I go wrong? What can I do to fix both the battery and the hard drive?

J. Mark Delaney
Frostburg, Maryland

Got a burning question regarding DOS or Windows computing?

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I'm sorry this happened to you. But you're lucky: You can get to your hard drive to perform a backup of your data. Get as much information off the hard drive as possible, if you haven't already, and keep it somewhere safe, either on regular floppy disks, on high-capacity floppy disks for a ZIP drive, or on tape.

Also, make sure you have a bootup floppy disk and that it contains a copy of FDISK.EXE and FORMAT.COM.

Once you've done that, it's time to heal your computer. The first thing you should do is replace the battery. If you're uncomfortable opening the case, or if you can't find the CMOS battery after looking around a while (some batteries don't even look like batteries), take it to a technician and ask for help.

Your next step is finding the correct settings for your hard drive. You can either ask a technician to look them up for you (they're published in a number of technical reference volumes that you probably won't find at your local bookstore), or you can call the hard drive's manufacturer. To set up your drive correctly, you need to know the manufacturer's name, the drive's model number, and whether your drive conforms to the MFM, RLL, ESDI, or IDE standard.

With all the information in hand, start your computer, press the special key combination to get to its hardware-setup program, and enter the correct drive values and all other pertinent information about your system. That part is easy. After typing it in, *write it down*, and keep it for future reference—in case your battery dies again. It's possible, though unlikely, that your first battery failed because a short in your system drained it.

The final step is setting up your drive as though it were new. If it's a very old MFM, RLL, or ESDI drive, you can start by performing a low-level format, although that isn't strictly necessary. Don't try to run a low-level format on an IDE drive.

Next, run FDISK.EXE from your bootup floppy disk to make sure your disk is set up for a single partition or the number of partitions you want. Then use DOS's FORMAT C: /S command to create or recreate the file system that makes the drive bootable.

Now remove your emergency floppy from the drive and try to boot from the hard drive. Did it work? If so, you're back in business. If not, something is wrong with the CMOS settings, the partitioning, or the low-level format (if you have a non-IDE drive).

Before loading your software and data back onto the hard drive, I recommend that you do a thorough surface scan of the entire hard disk. You can use the DOS utility ScanDisk (SCANDISK.EXE), Symantec's Norton Disk Doctor, Gibson Research's SpinRite, or any comparable product.

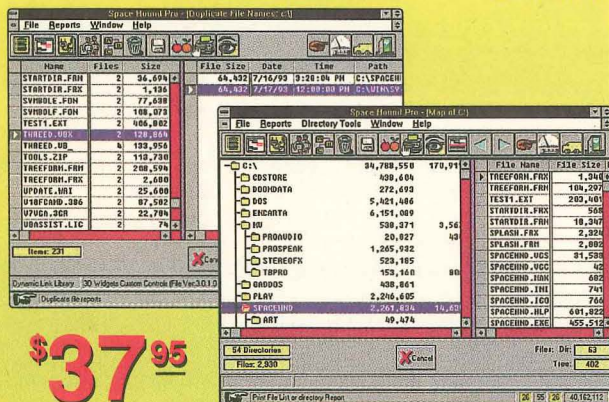
If your scanning utility does a thorough job, it should take a couple of hours to test the drive and, if you're using SpinRite, refresh it. Once everything is okay, it's safe to load your software back onto the machine. ■

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Best of the Batch

Deleting Files by Date

DELDATE.BAT (see the listing below) is a no-frills batch file that deletes groups of files in a directory by date. For example, to get rid of all files created on November 15, 1995, you'd type the following:

```
DELDATE 11-15-95
```

DELDATE.BAT first gives you a list of matches and asks you whether you want to proceed. If there's nothing on the list you want to delete, choose N to return to DOS. Otherwise, choose Y. After a few seconds of processing, DELDATE.BAT presents you with the first matching file. A menu lets you delete the file, skip it

and go to the next file, return to DOS, or view the file. (See the accompanying screen shot, page 16.)

If you choose to dump the file, DELDATE.BAT asks you to confirm the deletion. This is an extra precaution against accidental deletions; if you don't want the confirmation message, eliminate the /P switch at the end of line 97.

The viewing option uses DOS's TYPE command to display the files, which means that it's useful only for pure text files. If you use a third-party file viewer, substitute this line for line 76, replacing *filename* with the name of your viewer:

```
filename %2
```

DELDATE.BAT lets you delete a group of files in a directory by date. Note that line numbers are for convenience only; don't type them in. Also, lines preceded by a double colon (::) are remarks, which you can delete.

```

1  @ECHO OFF
2  IF "%1"==" " GOTO HELP
3  IF "%STRING%"==" " GOTO BUILDLIST
4  IF "%ABORT%"=="ABORT" GOTO END
5  IF "%1"==" /M" GOTO MENU
6  GOTO PROCESS
7  :BUILDLIST
8  :: This routine scans a directory listing
   for instances of
9  :: the search string typed at the command
   line; if it does not find
10 :: a string, it goes to :NOMATCH, which
   ends the program.
11 DIR | FIND /V "Volume"|FIND /V "bytes"|FIND
   "%1">NUL
12 IF ERRORLEVEL 1 GOTO NOMATCH
13 :: If there's a match, the program
   continues.
14 CLS
15 :: These lines list files for which the
   program found a match.
16 ECHO DelDate has found the following files
   that contain the string %1:
17 ECHO.
18 DIR /A-D| FIND /V "Volume"|FIND /V
   "bytes"|FIND "%1"
19 ECHO.
20 :: The program gives the user the chance
   to return to DOS.
21 ECHO Do you wish to continue?

22 CHOICE
23 IF ERRORLEVEL 2 GOTO END
24 IF ERRORLEVEL 1 CLS
25 ECHO Processing directory...
26 ECHO.
27 SET STRING=%1
28 :: This FOR/IN/DO takes each filename in
   the directory one by one and
29 :: then calls DELDATE.BAT, passing each
   filename along as a variable.
30 :: DELDATE.BAT processes each filename in
   the routine PROCESS
31 :: (see below). When all of the files have
   been processed, the FOR/IN/DO
32 :: ends, and DELDATE.BAT calls LIST.BAT,
   which has a list of matching
33 :: files created by PROCESS.
34 ::
35 FOR %A IN (*.*) DO CALL C:\BAT\DELDATE.BAT %A
36 ::
37 :: LIST.BAT holds a list of commands, one
   for each matching filename.
38 :: Each line in the list does the following:
39 ::
40 :: Calls DELDATE.BAT
41 :: Passes the value /M to DELDATE.BAT as
   parameter %1
42 :: Passes the the filename to DELDATE.BAT
   as parameter %2
43 ::
```

listing continued opposite


```

44 :: DELDATE.BAT picks up the /M parameter
    and jumps to MENU,
45 :: which then gives the user the
    opportunity to delete the file or
46 :: choose among several other options.
47 CALL C:\BAT\LIST.BAT
48 ::
49 :: When LIST.BAT is done, it returns to
    this point. The next few lines
50 :: handle housekeeping, then jump to END
    to close the batch file.

51 DEL C:\BAT\LIST.BAT
52 SET ABORT=
53 SET STRING=
54 SET THISFILE=
55 GOTO END
56 ::
57 :: The FOR/IN/DO above extracts each
    filename in the directory and
58 :: processes it in this routine.
59 :PROCESS
60 ::
61 :: If the directory listing of the
    extracted filename does not contain
62 :: a matching string, DELDATE.BAT jumps to
    the END routine and returns
63 :: to the FOR/IN/DO to pick up the next
    filename.
64 DIR %1|FIND /V "bytes"| FIND "%STRING%"|FIND
    " ">NUL
65 IF ERRORLEVEL 1 GOTO END
66 :: If the directory listing of the
    extracted filename does contain
67 :: a matching string, DELDATE.BAT sends
    the following line to LIST.BAT:
68 ::
69 :: CALL C:\BAT\DELDATE.BAT /M [filename]
70 ::
71 ECHO CALL C:\BAT\DELDATE.BAT /M
    %1>>C:\BAT\LIST.BAT
72 GOTO END
73 :: Routine to view ASCII files
74 :VIEW
75 CLS
76 TYPE %2 | MORE
77 PAUSE
78 CLS
79 ::
80 :: The MENU routine gives the user options
    for handling the file.

81 :MENU
82 CLS
83 ECHO The following file matches the search
    string, %STRING%.
84 ECHO Press the appropriate key:
85 ECHO.
86 DIR %2.|FIND " "|FIND /V "bytes"
87 ECHO.
88 ECHO 1 to DELETE
89 ECHO 2 to SKIP DELETE
90 ECHO 3 to RETURN TO DOS

91 ECHO 4 to VIEW FILE (ASCII only)
92 ECHO.
93 CHOICE /C:1234
94 IF ERRORLEVEL 4 GOTO VIEW
95 IF ERRORLEVEL 3 GOTO ABORT
96 IF ERRORLEVEL 2 IF NOT ERRORLEVEL 3 GOTO END
97 IF ERRORLEVEL 1 IF NOT ERRORLEVEL 2 DEL %2 /P
98 GOTO END
99 ::
100 :: DELDATE.BAT jumps to this routine if
    it can't find a match for the
101 :: specified string.
102 :NOMATCH
103 CLS
104 ECHO No match was found for the specified date.
105 ECHO Type DELDATE for help.
106 GOTO END
107 ::
108 :: This routine aborts the deletion
    process and returns to DOS.
109 :ABORT
110 ECHO Aborting delete.
111 SET ABORT=ABORT
112 GOTO END
113 ::
114 :: Help display
115 :HELP
116 CLS
117 ECHO.
118 ECHO Proper syntax for deleting by date:
    DELDATE 01-01-95
119 ECHO.
120 ECHO Proper syntax for deleting by time:
    DELDATE 10:00
121 ECHO.
122 ECHO You must be in the directory in which
    you wish to delete files.
123 ECHO.
124 ECHO Partial strings are allowed. However,
    DelDate will delete a file if
125 ECHO the string appears anywhere in the
    directory listing. For example:
126 ECHO.
127 ECHO DELDATE 12
128 ECHO.
129 ECHO would delete all of these files:
130 ECHO.
131 ECHO FILENAME DAT 1,035 12-14-95 1:54p
132 ECHO FILENAME BAT 962 04-12-95 8:11a
133 ECHO FILENAME TXT 12,381 05-17-95 2:11a
134 ECHO FILE12 DOC 786 01-01-95 6:22p
135 ECHO.
136 ECHO DELDATE will not accept commas as part
    of a string.
137 ECHO.
138 ECHO DELDATE must be in the directory C:\BAT.
139 ECHO.
140 :END

```

End

The following file matches the search string, 11-15-95.
Press the appropriate key:

ALLOC BAT 63 11-15-95 7:44p alloc.bat

1 to DELETE
2 to SKIP DELETE
3 to RETURN TO DOS
4 to VIEW FILE (ASCII only)

{1,2,3,4}?

The batch file DELDATE.BAT lets you selectively delete files created on a specific date.

DELDATE.BAT lets you use partial strings. Any one of the following commands would select files created on November 15, 1995 (11-15-95):

```
DELDATE 11
DELDATE -15-
DELDATE 5-9
```

Because DELDATE.BAT searches each file's entire directory listing for a match, however, you must be careful that you don't accidentally select files containing the string elsewhere, such as in the size or date. For example, while DELDATE 11 selects files created on 11-15-95, it also selects the following other files:

FILENAME DAT	11,035	12-14-95	1:54p
FILENAME DAT	9,342	12-26-95	2:11a
FILE11 DAT	1,032	10-17-94	3:14p

DELDATE.BAT's string-search technique means that you can also use it to delete files by time. For example, the following command deletes files created at 2:55 A.M.:

```
DELDATE 2:55a
```

In simplest terms, DELDATE.BAT works by searching a directory listing for the string and building a list of matching files in a temporary batch file called LIST.BAT. When it's done, DELDATE.BAT calls LIST.BAT, which returns each file to DELDATE.BAT, which then presents you with the four menu options. After all files in LIST.BAT have been processed, DELDATE.BAT deletes LIST.BAT and returns to DOS.

To work, DELDATE.BAT must be in your C:\BAT subdirectory, which must in turn be listed in your PATH statement. If you put it in another subdirectory, make sure you change the references to C:\BAT in the batch file. Also, you must be in the directory from which you're deleting files.

Finally, a bug in Windows 95 DOS generates a harmless but disconcerting error message under certain circumstances. If you choose the delete option

from the menu but then respond to the confirmation message by pressing N, Win95 DOS returns an "Access denied" message. That doesn't affect the batch file or the files in your directory. If it bothers you, delete the /P switch in line 97.

—Eric Maloney

Fast Recovery

UNDEL.BAT is a short batch program that can recover a file without asking you to answer yes to the prompt or to type the first letter of the filename:

```
@ECHO OFF
IF "%1"==" " GOTO END
SET VAR=%1
UNDELETE %1 /ALL >NUL
FOR %%A IN (%VAR%) DO SET VAR=%%A
REN %VAR% %1
:END
SET VAR=
```

To use UNDEL.BAT, simply type the following:

```
UNDEL [filename]
```

UNDEL.BAT gets the file back, no questions asked. It's particularly useful if you want to delete all but a single file in a directory. Type the command DEL *.* to erase the files and then use UNDEL.BAT on the file you want to preserve.

Note that UNDEL.BAT won't work under Windows 95's version of DOS, which doesn't support the FOR...IN...DO backslash in the fifth line.

—Jason W. Detamore

Jason—we have no address for you! Please drop us a line and tell us where you are.

—Eds.

Do you have a batch file that's particularly interesting, unique, or useful? Do you have an alternative to one of the batch files you see here? Then why not share it with your fellow DOS World readers and get \$50 to boot? Send your submission to "Best of the Batch," DOS World, 86 Elm St., Peterborough, NH 03458. Include a description of the batch file and how to use it, along with a disk containing the program. You can also send your batch file to our CompuServe address (75300,2357), our Internet address (75300.2357@compuserve.com) or the DOS World BBS (603-924-3181; 8,N,1). However you send it, please include your address (postal and e-mail) and phone number on all submitted material and in the batch file.

Shareware Exchange

by Hardin Brothers

There was a time when I judged shareware programs by the number of features they included. I almost always gave highest marks to glitzy multifunction programs. A program that can manage my hard drive, make coffee, and take my dog for a walk is certainly preferable to one that can only move files around dependably, isn't it?

But my tastes have changed. I'm no longer impressed by an overload of features; I'd rather have five programs that do one task each, easily and well, than one program that tries to perform five unrelated tasks.

None of the shareware programs reviewed here this month would win any feature battles or fancy screen awards—and I prefer them that way. They're all good at their jobs, simple to use, and, I believe, reliable.

The programs discussed here are available from the *DOS World* bulletin-board system (603-924-3181), as well as from most information services and local BBSes. (See the sidebar, "Share the Wealth," page 18, and the "DOS World BBS" section of "How to Use This Magazine," page 70 in this issue, for details on accessing the bulletin board. Registration fees are listed in "Product Information," page 20.)

Since When?

*I'm in charge of a number of stand-alone PCs in a high-school computer lab. Sometimes students find "interesting" ways to mess up the systems. My favorite shareware program, **Since**, makes pinpointing their changes a breeze, and it's vastly more efficient than the clumsy batch-file solution I used to use.*

David Schreiber
Scarborough, Ontario, Canada

None of these programs would win any feature battles or fancy screen awards—and I prefer them that way. They're good at their jobs, simple to use, and reliable.

I used to have a similar job, so I can sympathize with Schreiber's headaches—and *Since* would have been a welcome addition to my bag of tricks. I've also found that *Since* is very useful on my own PCs. It's easy to operate; it lists files that have been modified since a specific date and time, or files that have a specific attribute set. For example:

SINCE 03/01/96

lists all files that have been modified since the first of March. You can also use /S (for subdirectories) and /P (pause) options, which work the same way they do in the DIR command.

Also, you can add more than just a date to the command line; you can specify a starting time on that date and an ending date and time for the search. In addition, *Since* takes one other form:

SINCE A

This command lists all files with the archive attribute set. *Since* recognizes three attributes: A (archive), R (read-only), and S (system). For some reason, it doesn't recognize the attribute H (hidden); it would be handier if it did.

That's about all there is to *Since*, but it's certainly enough. You can send its output to a file for later reference or use in a batch file, and a simple user interface is available if you don't want to specify the date, time, or attributes on the command line. It's great for finding the files you need to back up, for finding the files you worked on yesterday, or for discovering which system files are stored on your hard disk.

Since is missing two features I'd like to see: the ability to list files without a specific attribute set (for example, files whose A attribute isn't set because

they've already been backed up) and a way to specify which files you want to see. For example, I'd like to be able to generate a list of backed-up TXT files, like so:

```
SINCE -A *.TXT /S
```

but Since doesn't recognize either the -A or the *.TXT syntax. Nevertheless, it's an inexpensive program that does one thing well. And for that reason, I like it.

What's on the Menu?

DOS-based menu programs used to be very popular. In fact, one of them was perennially one of the best-

SHARE THE WEALTH

Our "Shareware Exchange" column invites you to send a copy of your favorite shareware program on disk, along with a description and an explanation of why you like it (no more than 500 words) to Shareware Editor, *DOS World*, 86 Elm Street, Peterborough, NH 03458. Tell us how we can obtain a copy of the program. We'll select a pick of the month for each issue and pay the contributor \$50. Other contributors will receive a \$10 finder's fee. Please don't send us shareware you've written yourself; we prefer recommendations from users, not authors.

When you send in a program for consideration, make sure it's either shareware or freeware. I've received several submissions that were neither. We publish all programs mentioned here on the *DOS World* BBS, and we can't do that unless the program includes distribution information and instructions. Please don't send registered versions of programs; we can't publish those. Send only shareware and freeware versions.

Finally, either send us the latest shareware or freeware version available or tell us where we can get it. You can help us if you contact the program's distributor and tell him or her that you're sending a program, along with your recommendation, to us. If a distributor wants to get in touch with me, you can give him or her my e-mail address: hardin@RT66.com. But please don't send submissions to that address; send them directly to the magazine.

Contact us on CompuServe at **75300,2357**; on the Internet at 75300.2357@compuserve.com; or on the *DOS World* BBS at **603-924-3181**. All programs featured in "Shareware Exchange" are available by modem from the *DOS World* BBS (instructions on page 70). Since (SINCE137.ZIP), DougMenu (DMENU177.ZIP), FormGen (FMGEN40A.ZIP), and StupenDOS (SD-500.EXE) are in File Area 5. Windows Commander (WCMD202.ZIP) is in File Area 7. In addition, most of the programs described in "Shareware Exchange" can be found on major on-line services and local BBSes.

—H.B.

```
F:\PBORO\SWARE\SINCE>Since A
SINCE 1.37 Copyright (c) 1991-95 by RPMcCormick. Serial Number 1936
UNREGISTERED Evaluation copy.

Files in F:\PBORO\SWARE\SINCE with attribute A :
F:\PBORO\SWARE\SINCE\
A SINCE.DOC 6041 bytes 01/17/95 08:29
A SINCE.EXE 42282 bytes 02/15/96 09:10
A CATALOG.TXT 7998 bytes 04/23/95 15:40
A SINCE137.ZIP 35564 bytes 06/17/95 21:46
A SINCE.FRM 2933 bytes 12/12/94 07:52
A REGINFO.TXT 3185 bytes 12/19/94 20:15
A FILE.ID.DIZ 449 bytes 05/10/95 01:37
A SINCE.CFG 83 bytes 02/19/96 13:18
A SINCE.PIF 967 bytes 02/15/96 09:12
9 of 9 total files in F:\PBORO\SWARE\SINCE were listed. (99502 bytes)

F:\PBORO\SWARE\SINCE>
```

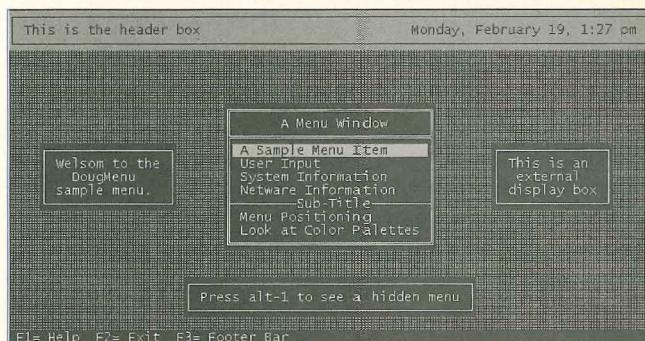
Since, our pick of the month: This simple program lists files modified since a particular date or those with a particular attribute set—great for finding the files you need to back up, the ones you worked on yesterday, or the system files on your hard drive.

selling shareware products available. But in recent years, with DOS Shell, other shell programs, and Windows taking over as user interfaces, menu programs have almost disappeared.

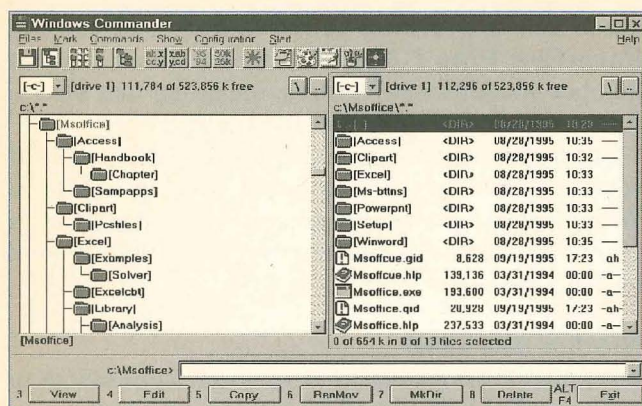
DougMenu is one menu program that's still around and still actively supported. In fact, I found a beta copy of an upcoming version while I was working on this column; by the time you read this, that new one may be released. Unlike many menu programs, which are simply complex batch programs in disguise, DougMenu offers some impressive capabilities.

DougMenu can load memory-resident programs without fragmenting memory because it has no memory overhead at all when it launches programs. It includes support for many different languages, including German, French, Spanish, Danish, Dutch, and Portuguese. It includes a built-in screen saver; you can use it to control coworkers' access to your computer; it provides full mouse support; and it's compatible with Novell networks. (In fact, DougMenu was originally developed to replace the menu software Novell distributes.)

But what impresses me most about DougMenu is its extensive set of commands. You create menu scripts with a text editor and then give them to the executable program to interpret and carry out. It takes a little while to learn the script language, because DougMenu supports more than 50 commands; once you learn them, though, you can put



DougMenu: More than just a souped-up batch-file menu system, this DOS program offers additional features, such as a screen saver and user-access control.



Windows Commander: If you like the DOS-based Norton Commander, this Windows File Manager replacement has a similar look and feel.

have to stick with the default colors; you can pick any hues you like for any part of the screen. StupenDOS is pleasant to use and strikes a happy medium between the DOS command line and programs like DOS Shell that seem to take over everything. If you haven't found a shell that fits your computing habits, give StupenDOS a try.

Commander Replay

Frequent readers of this column know that I use Symantec's Norton Commander as my DOS shell, and that I'm happy enough with that program that I'm not particularly interested in adopting another shell for DOS text-mode work. I've discussed several in this column over the last three years, but I keep going back to Norton Commander for my own work.

So when I was browsing through some Usenet newsgroups on the Internet recently, I was intrigued to read about a Windows-based shareware shell called **Windows Commander** that closely resembles the DOS-based Norton Commander. I don't particularly like Windows 3.x's File Manager, and I'm not a whole lot more impressed with Windows 95's Explorer for file-management tasks. But a Commander-like program for Windows? That might be just what I need to keep files and directories in order.

It didn't take me long to download and install Windows Commander, and I haven't been disappointed. At first, I was a little disconcerted by the menus; they're more like Windows and less like the Norton Commander I'm familiar with in DOS. But then I realized I could easily redefine the menus and organize them the way I wanted them. In fact, a menu structure that closely mimics the original is included with the program. You can also customize the button bar or toolbar beneath the menus to include any programs you like.

But more than anything, Windows Commander just feels right to me, probably because of my years of working with Norton Commander. Either window can display a file list in full (detailed) mode or short

(name-only) mode. In addition, either window can display a subdirectory tree for the drive shown in the opposite window. The keyboard shortcuts aren't quite the same for the two programs, but I'm not complaining; they're close enough that I can move between them without a problem. I'm impressed. And unless I find something I like even better, which is unlikely, I'll probably be registering Windows Commander in the next few days.

And the Winner Is . . .

The best shareware this month, the program you really should try, is Since. It isn't a marvel of programming skill, nor does it have a flashy interface. When I first looked at the program, I had no idea why I would need it. After using it for a short time, however, I'm convinced that it deserves a place on my hard drive. It's simple, it's to the point, it performs a job no other program has been doing for me, and it has convinced me that it's essential. That's about the highest recommendation I can give any program. ■

PRODUCT INFORMATION

DougMenu 1.77

Douglas Bell
1726 Coventry Road #3
Cleveland Heights, OH 44118-1130
e-mail dm@wariat.org
freeware
optional registration \$30
deluxe registration \$100

FormGen 4.0a

Randy MacLean
FormGen Corporation
13 Holland Drive
Bolton, ON L7E 1G4
Canada
905-857-4141
\$35

Since 1.37

R.P. McCormick
79 Rye Street
Broad Brook, CT 06016
\$8
\$12 including disk

StupenDOS 5.0

Eclipse Technologies
P.O. Box 23136
Milwaukee, WI 53223
414-354-7040
\$35

Windows Commander 2.02

Christian Ghisler
Lindenmattstrasse 60 CH-3065
Bolligen, Switzerland
\$36

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DW#23: Troubleshooting the Problem PC

Analyze your ailing PC: Learn what DOS can do to help and when it's time to turn to a commercial program for help. **FREE PROGRAM:** Debug script helps you navigate nested directories. Part II: Using batch-file symbols wisely. Choosing a high-speed modem: 28.8kbps. Using DOS's Defrag to maintain your hard drive. Setting up Windows for different users. Reviews: Take Command and FastLynx Lite. Plus 30 tips for DOS and DOS applications.

DW#24: MS-DOS "7"

The DOS Microsoft Won't Tell You About! Our first look at the DOS within Windows 95, its distinctions and its features. Tips and tricks with DOS's PATH. How to Choose a Screen Capture Program. Sneaking back to the prompt in Windows 95. Using Exit Codes in Debug scripts. Part I: Elegant programming techniques make FileFind an expert at locating files based on name or keyword. Upgrading DOS on an older computer. Plus 35 tips for DOS and DOS programs.

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Minding The Storage

A gigabyte of hard-disk storage sounds like a lot—until you run out of space. These file-management techniques will help you get the most out of the disk you already have.

by Eric Maloney

A professor (whom I'll call Dr. Smith) at a nearby college had a problem. The meager 50MB hard drive on her decrepit 386 PC was stuffed to the rafters. When I say stuffed, I mean *stuffed*: A directory listing revealed that she had only 2MB of free disk space, all of which Windows was using for its swap file. The problem was so severe that she was saving her data files on floppies.

Dr. Smith hoped to get a new PC soon, but college budgets (and bureaucracies) being what they are, "soon" was a relative term. Her immediate need was to free up at least enough disk space for her Word documents.

An initial look at the contents of her drive revealed little fat. Dr. Smith's root directory contained only a few subdirectories—for Windows, DOS, Word, networking software, and a few other small programs. But then I noticed something peculiar. Someone from the campus computer lab had installed

a new e-mail program, Eudora, six months earlier. In its directory was a 5MB file called TRASH. What could this mysterious file be, and why was it so big?

Perhaps you've guessed. TRASH was a temporary file in which the program dumped all of Dr. Smith's deleted e-mail. The lab had failed to set up the program to take out the trash automatically. Dr. Smith had no idea the file even existed; she was under the misconception that "deleted" actually meant *deleted*, so the trash had been piling up for six months.

Needless to say, we dumped the trash. I then deleted a variety of useless files from her \DOS directory (including Microsoft's DOS and Windows antivirus software, which had been superseded by a third-party program) and purged a directory of forgotten text files.

When we finished, the amount of free space had risen fivefold to 10MB—paltry by today's standards, but enough to get by with until a new PC arrived (with any luck, within this millennium).

Free at Last?

Perhaps you're in a more fortunate position than Dr. Smith: You've got a new PC with more storage space than you'll ever need. If so, be warned. Before you can ask, "Why are software vendors distributing

```

Corrections will not be written to disk

9 lost allocation units found in 4 chains.
73,728 bytes disk space would be freed

361,553,920 bytes total disk space
7,266,304 bytes in 122 hidden files
3,874,816 bytes in 463 directories
323,706,880 bytes in 7,683 user files
26,632,192 bytes available on disk

8,192 bytes in each allocation unit
44,135 total allocation units on disk
3,251 available allocation units on disk

655,360 total bytes memory
562,832 bytes free

Instead of using CHKDSK, try using SCANDISK. SCANDISK can reliably detect
and fix a much wider range of disk problems. For more information,
type HELP SCANDISK from the command prompt.

C:\PCS>

```

Photo 1. Use the DOS CHKDSK command to find out your hard drive's minimum cluster size.

their programs on CD-ROM?," your 1GB drive is going to be as packed as Dr. Smith's 50MB drive.

We PC users live in an age of conspicuous storage consumption. Like the first Europeans to gaze across America's vast prairies, we have a hard time imagining a 1GB drive ever becoming overpopulated. But today's wide-open spaces are tomorrow's urban congestion. (Just ask a native of Phoenix or San Jose.) Programs and files have a way of taking over the neighborhood faster than you can come up with new zoning laws.

The fault lies not entirely with us. Software vendors use whatever resources the day's technology has to offer; as resources expand, so do the needs of the programs you buy. If ÜberSoft Office Suite took up 20MB when 100MB hard drives were standard, chances are it'll take up 200MB when 1GB drives become *de rigueur*.

Still, the responsibility for managing our resources rests with us. The illusion of limitless resources encourages us to be slovenly. Most of us don't give a second thought to keeping megabytes of unused or useless files on our hard drives. We clog our disks with hundreds (in my case, thousands) of little files occupying many times their actual size.

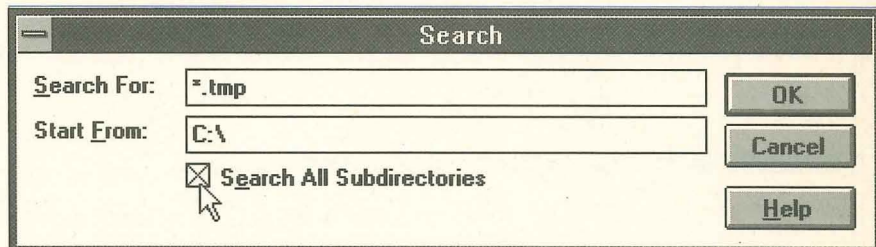


Photo 2. Choose File/Search from File Manager's main menu to look for space-wasting temporary files.

The tips presented in this article are designed to help you map out a proactive plan for disk conservation. If you know how your computer wastes space, you can grab that space before your computer does. Even if you've got an older system with a drive that's already clogged, all is not lost. Here's your chance to reclaim the storage your computer's stolen from you. You've probably got megabytes of storage that you, like Dr. Smith, don't even know you have.

TIP #1

Avoid small files; they're disk-space hogs.

Pound for pound, small files waste far more disk space than large files do. The reason is that small files occupy more space than they need—conceivably, hundreds of times more space. **Table 1**, "Space Wasters" (below), shows a sampling of files that typically come in

small packages. (Windows 95 users should also check out the sidebar "Analyzing Your Drive for Small Files," page 25.)

Small files are wasteful because of the way your drive is designed to store files. A drive is divided into fixed storage units called *clusters*. A file occupies at least one cluster, no matter how big the file actually is.

For example, on a 1GB drive, a cluster might be 32,768 bytes. Any file that's smaller than 32,768 bytes still uses at least one cluster. Thus, a 300-byte file chews up an extra 32,468 bytes. (Because your computer allocates only full clusters, large files can also take up more space than needed. For example, a 33,000 byte file will actually occupy 65,536 bytes; the 232 bytes that don't fit in the first cluster use an entire second cluster.) Smaller drives have smaller clusters. On my 344MB drive, a cluster is 8192

TABLE 1: SPACE WASTERS

Little batch and icon files may not look as though they take up much room, but they're deceptively space-consuming. Here's a sampling of files to look for.

File Type	Extension	Description
text files	WRI, TXT	Write and Notepad files. These proliferate if you create many short memos or notes.
batch files	BAT	Only rarely are batch files larger than a few thousand bytes. You probably don't have to worry about batch files unless you're a batch-file programmer.
bit-mapped graphics	BMP	A bunch of 630-byte BMP files come with Windows for creating wallpaper.
icons	ICO	If you start downloading lots of icons, remember that the typical icon is only 766 bytes.
Win95 shortcuts	LNK	Usually between 300 and 400 bytes.

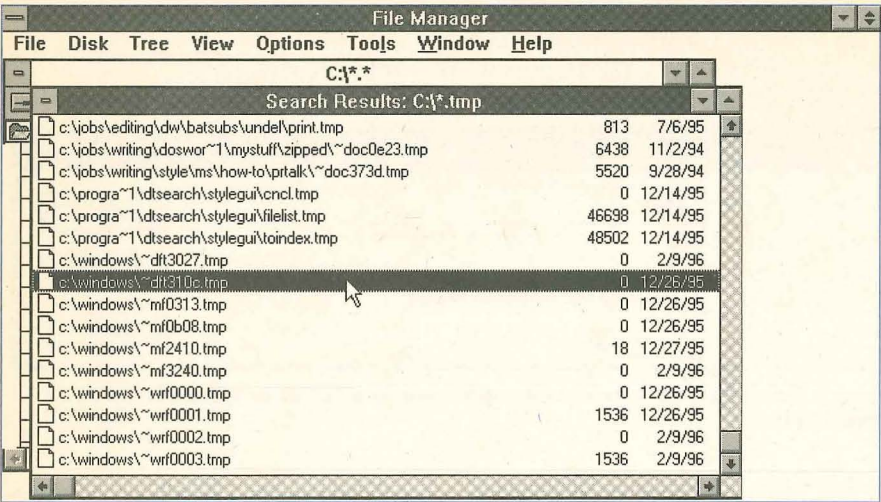


Photo 3. File Manager gives you a list of all temporary files, from which you can selectively delete the ones you don't need.

bytes. A floppy disk might have 512- or 1024-byte clusters.

Whatever the cluster size, tiny files can take up a surprising percentage of your storage. Let's assume, for example, that you've got 100 assorted text, e-mail, and batch files whose average size is 500 bytes. (Sound small? That's what I thought, until I discovered that my hard drive holds 1485 files smaller than 500 bytes in size.) Together, the files use only 50,000 bytes. But the actual disk space they'll occupy is 819K on a 362MB drive or 3.2MB on a 1GB drive. **Table 2**, "The Truth About Cluster Size" (below), shows the grisly numbers.

How do you find out the cluster size on your hard drive? DOS and Windows offer several ways, all of them easy. The quickest option is to run CHKDSK. At the command prompt, just type CHKDSK. If you're in Windows, you get to the command prompt by clicking on the MS-DOS Prompt icon; alternatively, choose File/Run in Program Manager (Windows 3.1) or Run from the Start menu (Windows 95) and type COMMAND.

After a few seconds, your computer will display a screen of information that looks something like the one in **Photo 1** (page 22). The cluster size is to the left of the line

that reads "bytes in each allocation unit" (in **Photo 1**, 8192).

TIP #2 Delete unnecessary temporary files.

Many programs, especially Windows programs, create temporary files in which they put data for later use. For example, when you print a document from your word processor, Windows might set up a temporary print file, which it feeds to the printer while you continue working.

Alas, programs aren't always conscientious about removing these files after they outlive their usefulness. To compound matters, temporary files are sometimes left behind when, for example, somebody turns off your computer without exiting

Windows properly. It's easy to accumulate several megabytes of useless temporary files without even knowing it.

The solution is to search out and destroy these files. DOS users can find them by typing the following line at the command prompt:

```
DIR *.TMP /S
```

DOS returns a list of all hard-drive files ending in the extension TMP.

If your drive is big or you plan to do regular housekeeping, you'll need some kind of file manager or shell. DOS comes with a such a program: DOS Shell, which makes it easier to move among directories, view the contents of files, and delete them if necessary. Shareware shells with better searching and viewing capabilities are available from various on-line services.

Users of Windows 3.1 or Windows 95 can use File Manager. (If you're a Win95 user and you can't find File Manager, type WINFILE in the Start/ Run dialog box.) Take the following steps:

- 1. Choose File/Search from the main menu. File Manager displays the Search dialog box. (See **Photo 2**, page 23.)
- 2. Type *.TMP in the Search For box.
- 3. Type C:\ in the Start From box.
- 4. Make sure there's a check next to the Search All Subdirectories option.

TABLE 2: THE TRUTH ABOUT CLUSTER SIZE		
A 500-byte file occupies 65 times more actual disk space on a 1GB drive.		
Drive Capacity	362MB	1GB
Cluster Size	8192	32,768
Number of Files	100	100
Average File Size	500	500
Total File Size	50,000	50,000
Drive Space Used	819,200	3,268,000
Ratio Used:Unused	16:1	65:1

- Click on the OK button. After your hard drive grinds away for a few minutes, you'll get a display like the one in **Photo 3** (opposite).

You can easily tell how much disk space you'll gain by deleting TMP files. Select the files you plan to delete and press Alt+Enter. (You can select files individually by holding down the Ctrl key as you click on each item; you can select all files by pressing Ctrl+.) Windows displays a Properties dialog box showing the collective size of the selected items. (See **Photo 4**, above.)

Windows 95 users have another, more convenient option for rooting out TMP files: the Find tool. The procedure is similar to File Manager's File/Search:

- Choose Find/Files or Folders from the Start menu. (Or move your mouse cursor to an empty part of the desktop and press the F3 key.)
- Make sure there's a check next to Include Subfolders.
- Type *.TMP in the Named text box (or click on Advanced and choose TMP File from the Of Type selection list).
- Choose the Find Now button. Your Find dialog box will look like the one in **Photo 5** (page 27).

If you're strictly a DOS user, you can delete TMP files without too much fear that you're erasing useful data. Windows users need to be more careful; some TMP files may be in use. A good rule of thumb is to delete files only if they're, say, at least a week old.

TIP #3 Delete backup files you don't need.

Many Windows programs, including word processors and spreadsheet software, let you set an

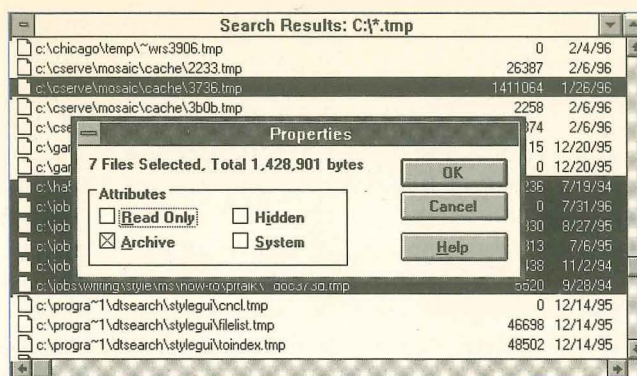


Photo 4. To find out how much space you'll save, select the files you plan to delete and press Alt+Enter to display the Properties box.

option that automatically creates a backup of the documents you save; the backup usually contains the previous version of the document or spreadsheet. Other programs give you a backup option if you try to save a document to a filename already in use. These backups often hang around long after you've finished with the original file and archived it. If these backups might

be useful to you later, put them on floppy disks for permanent storage. Otherwise, delete them.

Finding backup files isn't as easy as finding temporary files, because different programs use different extensions for their backups. For example, 1-2-3 uses BAK, while Microsoft Word uses WBK. You'll have to refer to your programs' documentation to find out the proper extensions.

Then follow the same steps for finding and deleting backup files as you did for TMP files (see Tip #2, opposite).

If you use Win95, your Recycle Bin and collection of shortcuts may present additional space problems. See the sidebar "For Win95 Users Only" (page 28) for advice on managing these two sources of hard-disk clogging.

WIN95: ANALYZING YOUR DRIVE FOR SMALL FILES

Although proactive measures are smart, chances are you already have lots of small files hiding all over your hard drive. You can take a variety of actions to reduce their number, including deleting, archiving, and compressing them. But first, you need to assess whether you've got a small-file problem to begin with. For Win95 users, the solution lies with the Find command.

Find has a relatively obscure but valuable option that lets you search your drive for files of a certain size. You can easily find files that are smaller than your hard drive's cluster size and determine which ones you really want to keep. Follow these steps:

- Choose Find/Files or Folders from the Start menu. Windows displays the Find dialog box.
- In the Name & Location panel, make sure the Include Subfolders box is checked.
- Click on the Advanced tab.
- Click on the first selection box next to Size Is and choose At Most.
- Click on the second selection box next to Size Is and enter the cluster size of your system in megabytes. For example, if the cluster size is 32,768, enter 32.
- Choose the Find Now button. After a few minutes, Find displays a list of files at the bottom of the dialog box.
- Click on the Size heading button to sort the files by size, smallest files first. You'll have to scroll past the folders and zero-byte files to get to the files you want to examine.

—E.M.

TIP #4**Know thy communications software.**

As Dr. Smith's experience shows, some e-mail packages don't actually get rid of deleted mail but instead store it in a temporary file, where it lingers until you decide to dump it for good. The way to avoid the problem with Eudora was to set it up to automatically purge the file called TRASH each time Dr. Smith runs the program.

But communications packages can swell your drive with other file types you may not know about. For example, WinCim, CompuServe's

Windows communications program, has an option that lets you save all your outgoing mail automatically. If you don't disable this option, you'll start accumulating a stack of files with cryptic names such as 314F89E4.P LX buried in a sub-sub-sub-subdirectory called C:\C SERVE\FCABINET\CABINET\FOLDER00.000. And because e-mail messages are often small, they occupy a deceptive amount of space. When I recently checked my own \FOLDER00.000 subdirectory, I found 354 files totalling 352K but occupying 2.9MB. A scan of my other mail

subdirectories, which constituted mostly incoming mail I'd saved voluntarily, revealed 530 files totaling 787K and taking up 4.6MB.

The solution is knowing what incoming and outgoing mail your communications package saves, where and how it saves the information, and what options you have to manage the data storage. When possible, enable options that set limits on how much information is stored or clean out your mail bins automatically. At the very least, go through your stored mail periodically and get rid of old downloads you no longer need.

TABLE 3: NONESSENTIAL WIN3.1 FILES

Below is a sampling of Windows 3.1 programs and accessories in your \WINDOWS directory that you can delete safely if you don't use them. Don't delete any of these programs if you're not sure what they do or whether you might need them in the future. Don't delete them unless you have a reliable backup or your original installation disks.

Program	Filename	Size (K)
Calculator	CALC.EXE	43
	CALC.HLP	18
Calendar	CALENDAR.EXE	60
	CALENDAR.HLP	21
Cardfile	CARDFILE.EXE	93
	CARDFILE.HLP	25
Character Map	CHARMAP.EXE	22
	CHARMAP.HLP	11
Clock	CLOCK.EXE	16
	CLOCK.INI	0
NotePad	NOTEPAD.EXE	33
	NOTEPAD.HLP	14
Paintbrush	PBRUSH.EXE	183
	PBRUSH.HLP	40
	PBRUSH.DLL	7
Recorder	RECORDER.EXE	39
	RECORDER.HLP	18
	RECORDER.DLL	10
Write	WRITE.EXE	245
	WRITE.HLP	37
File Manager	WINFILE.EXE	147
	WINFILE.HLP	77
Solitaire	SOL.EXE	181
	SOL.HLP	14
Terminal	TERMINAL.EXE	148
	TERMINAL.HLP	36
Total		1538

TIP #5**Dump your shareware's ancillary text files.**

A typical shareware program comes with a README text file, an order form, upgrade information, and other little text files you'll never use. Either delete them or store them on a floppy with the rest of the program's files.

TIP #6**Compress files you don't use often.**

If there's one third-party program no user should be without, it's a file compressor. The *de facto* standards are PKZip from PKWare and WinZip from Nico Mak Computing. Both let you compress groups of files you don't use often but don't want to get rid of. Although other compression formulas exist, the Zip method is far and away the most popular. (For more information on compression, see "Easy as 1-2-Zip," page 30 in this issue.)

Here's an example of how to use a file compressor. Let's say that Mary has to compile a spreadsheet summarizing expenses for the month. Each spreadsheet is about 118K. She doesn't need to access previous months often, but they should be available for reference. Because spreadsheets compress well, she can use PKZip or WinZip to reduce each one to about 36K: a savings of nearly 70 percent. Over the course of a year, zipping her

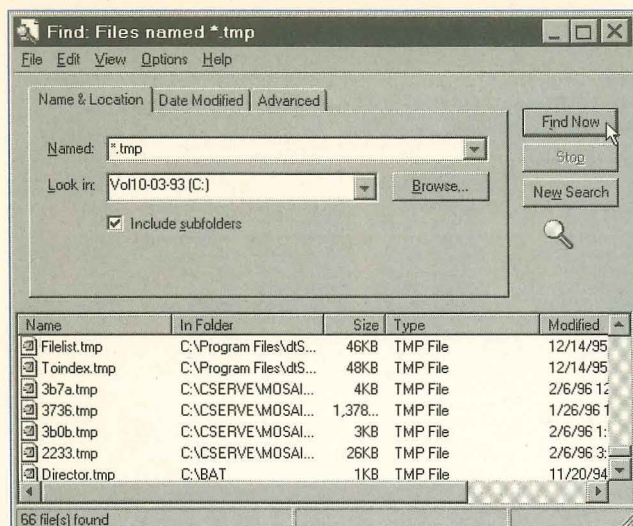


Photo 5. In Windows 95, use the Find command from the Start menu to root out temporary files.

spreadsheets will save Mary about 1MB of disk space. And she can save a bit more by putting them all into a single archive, as in **Photo 6** (above).

TIP #7

Compress related groups of files.

Let's say, for example, that you've got a dozen shareware utilities, each with a small, 7K documentation file. Because each doc file takes up a full cluster, together they actually occupy about 393K on a 1GB hard drive. But in a single Zip file called DOCS, they compress to two clusters, or 66K: a savings of more than 80 percent.

TIP #8

Collect text note files into larger files.

On a 1GB machine, 20 e-mail messages averaging 1000 bytes each occupy 655,360 bytes of storage. Putting them into a single file called EMAIL.TXT reclaims 19 clusters, or 622,592 bytes.

TIP #9

Delete unnecessary DOS and Windows files.

Many people who upgraded to DOS 6.x from an earlier version don't realize (or they forget) that DOS 6.x saves the old version in a temporary directory.

You can reclaim several megabytes of disk space by deleting that

older version. Look for a directory named \OLD_DOS.1 and get rid of it.

Your active DOS directory also contains files you may not need. Which files you can delete safely depends on which DOS features you're using. The following list isn't comprehensive, but it will get you started:

- If you're using a third-party virus scanner, you can get rid of Microsoft's DOS and Windows virus-checking files and reclaim about 800K of space. These files, in your \DOS directory, are MSAV*.*, MWAV*.*, and VSAFE.COM.
- If you use a third-party backup utility or don't need one, delete MSBACK*.* and MWBACK*.*, Microsoft's DOS and Windows utilities. That will free up about 1.5MB of space.

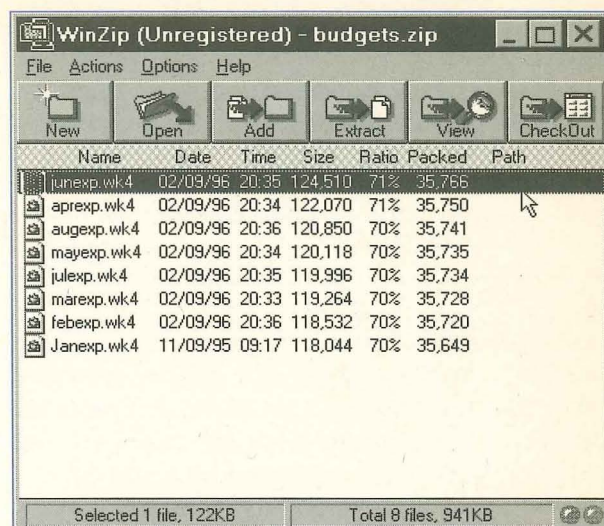


Photo 6. Storing seldom-used spreadsheets in a single WinZip archive reduces their size by 70 percent.

- If you don't use the DOS Shell module, delete DOSSHELL.EXE and DOSSWAP.EXE. Together, they're worth more than 400K of precious disk space to you.
- If you don't use Microsoft's drive-compression program, delete it to recover about 360K. Depending on your version of DOS, the files are called either DBLSPACE.* or DRVSPACE.*.
- If you use DOS 6.x and Windows, you might have two copies of Microsoft System Diagnostics, MSD.EXE. Delete the one in Windows; it's the older version. You'll save about 156K.

If you use Windows, be aware that your \WINDOWS directory contains a variety of programs, many

continued on page 29

DOS Tip

Watch Your Remarks

Ordinarily when you precede a batch command with a REM statement, DOS ignores the line entirely. But "remarking out" a line containing one of DOS's three redirection symbols can produce problems. When DOS encounters a line with a less-than (<), greater-than (>), or pipe (|) symbol, DOS carries out the redirection *before* processing any other information in the line.

If you get unexpected results after disabling a line with REM, check to see whether redirection is getting in your way. Better yet, eliminate the potential for trouble by disabling commands with a double colon (::). Although a single colon (:) will also do the job, it's best to avoid using that symbol unless you're sure you won't use labels such as :NO and :YES in the batch file.

FOR WIN95 USERS ONLY

Win95 users have three new file-management features: the Recycle Bin, shortcuts, and folders. Although they account for much of Win95's attraction, they're not without their price: Each can have an impact on your hard-drive storage. These tips will help you make sure you're using Win95 efficiently.

- **Lower the capacity of your Recycle Bin.** Out of the box, Win95 sets aside up to 10 percent of your hard drive for the Recycle Bin. That's 100MB on a 1GB drive. Unless you install and delete a number of large programs, you won't fill the bin for quite some time, which means that it will become jammed with megabytes of files you deleted months ago. Stuffing a bin with moldy old files is like owning a Dumpster the size of your garage. What are the chances you'll ever want to dive in for last Christmas's fruitcake? You'll save a huge chunk of real estate simply by lowering the percentage to something more modest—5 percent, or even less. On an 850MB hard drive, that's 4.25MB. Here's how:

1. Right-click on the Recycle Bin icon and choose Properties.
2. In the Recycle Bin Properties dialog box, click on the panel containing the name of your hard drive and the drive letter. (See **Photo 1** for an example.)
3. Move the horizontal slider to the percentage you want.
4. Choose the OK button.

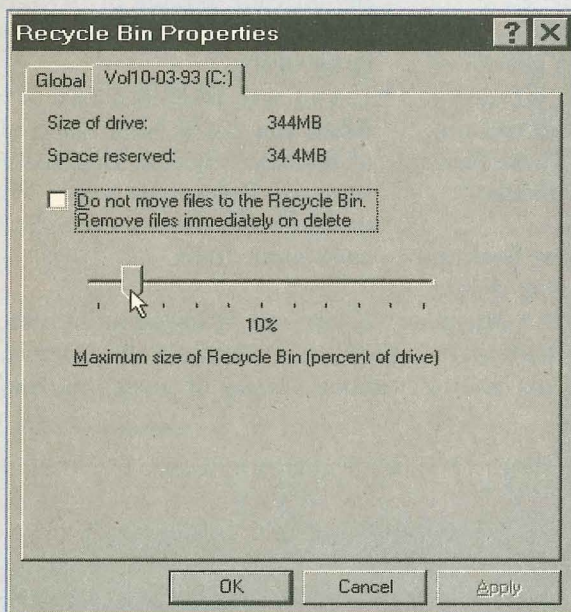


Photo 1. Use the Recycle Bin Properties dialog box to lower the amount of disk space reserved for deleted files.

- **Monitor your Recycle Bin.** You can dump your trash by right-clicking on the Recycle Bin icon and choosing Empty Recycle Bin from the shortcut menu. Understandably, though, most of us are reluctant to take such a drastic step. Your bin probably contains items that fall within a range of priorities, from old files you'll never need again to newer files you'd still like to protect.

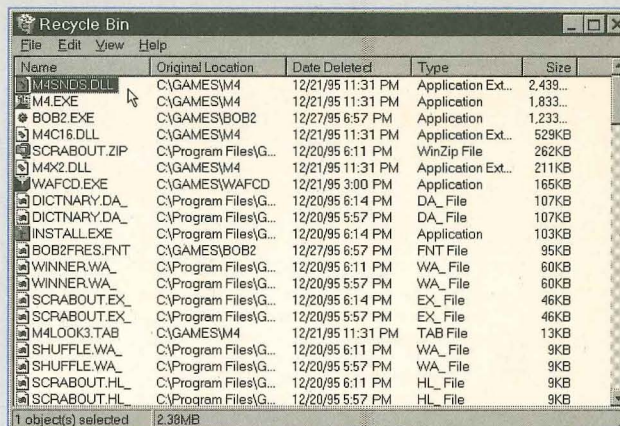


Photo 2. Sort your Recycle Bin items by size to find out which ones are taking up the most space. Here, 16 percent of the files account for 99 percent of the storage.

The reasonable alternative is to check your Recycle Bin regularly and delete selected files. Depending on how much action your drive gets, "regularly" could mean once a month, once a week, or even once every day.

Open the bin folder by clicking on the Recycle Bin icon twice. The status bar tells you how much disk space the bin currently uses. (If your status bar isn't showing, choose View/Status Bar from the main menu.) Often, you can reclaim most of the space your bin files occupy by killing only the largest items. In **Photo 2**, for example, the largest 16 of 120 files take up 99 percent of the bin space. Sort files by size, largest files first, by clicking on the Size-heading button. (Click on the button to toggle between sorts in ascending and descending order.)

- **If you're deleting a file you know you'll never want to reclaim, don't send it to the Recycle Bin; just kill it.** You can keep your Recycle Bin neater if you send it only those files you may want to reclaim later. If you're deleting a file you absolutely, positively, know you'll never need to recover, then you're better off simply deleting it permanently.

You can eradicate a file in either of two ways. Select the file and press Shift+Delete; or right-click on the filename, press the Shift key, and click on Delete.

In both cases, Windows displays a Confirm Delete dialog box asking whether you really want to get rid of the item. (See **Photo 3**.) This is your last chance to change your mind; once you say yes, you can't recover the item without the aid of a third-party utility or the know-how to use DOS's deadly UNDELETE command.

- **Analyze your hard drive for unnecessary shortcuts.** Here's a chilling statistic: On a 1GB hard drive, 400 shortcuts add up to about 144K, but actually occupy some 13MB of storage. That's about a 1:90 ratio.

At first glance, 400 shortcuts might seem like a lot; a new system won't have nearly that many. But shortcuts are insidious. Microsoft designed Win95 so that shortcuts are at the heart of

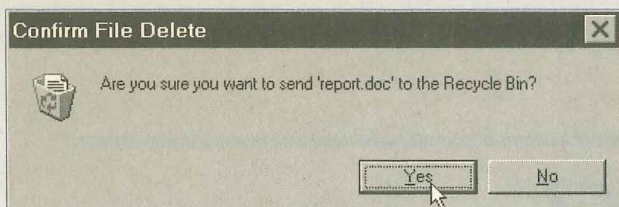


Photo 3. Press Shift+Del to delete an item without sending it to Recycle Bin.

file and folder organization. In fact, most Win95 tutorials encourage you to indulge in as many shortcuts as you want. Once you get the hang of them, you'll start popping shortcuts like pretzels at an Oktoberfest.

In addition to the shortcuts you create, most programs automatically add a cluster of shortcuts to your Start/Programs menu. If you've got a lot of software on your hard drive, your Start/Programs menus alone could easily contain several hundred shortcuts.

How many of these shortcuts do you need? Remember, a shortcut is nothing more than a pointer to a program or file. If you use a program once every leap year, must you have instant access to it? And do you require two or three shortcuts to the same program?

First, find out whether you have a shortcut problem. Use Find to list your shortcuts the same way you used it to locate temporary files in Tip #3 of the main article. Instead of typing *.TMP in the Named text box, type *.LNK, which is the extension Windows gives shortcuts. You can also choose Shortcut in the Advanced panel's Of Type selection box.

Once you have a list of shortcuts, sort them by name. (Click on the Name-heading button.) Scan the list for duplicates and shortcuts to programs you never use. In **Photo 4**, for example,

the search reveals three shortcuts to Calculator and two shortcuts to Cardfile. It's likely that these five shortcuts can be pruned to two—one for Control Panel and one for Explorer.

The most obvious place to start deleting shortcuts is with the Start/Programs menu. Get rid of everything you don't need and items that are also your desktop. Also, don't create shortcuts on your desktop for items you rarely use. Remember, they're only shortcuts, and you can always recreate them if you have to.

- **Ditto folders.** Each time you create a folder, you use a cluster. Make sure you delete temporary and data folders you no longer need.

—E.M.

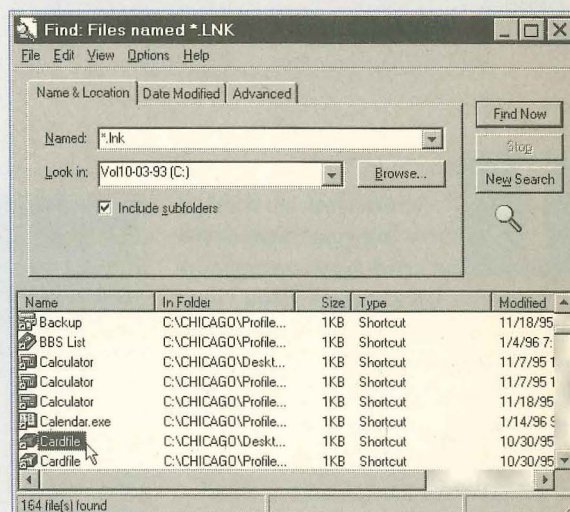


Photo 4. Use Find to locate and delete duplicate shortcuts.

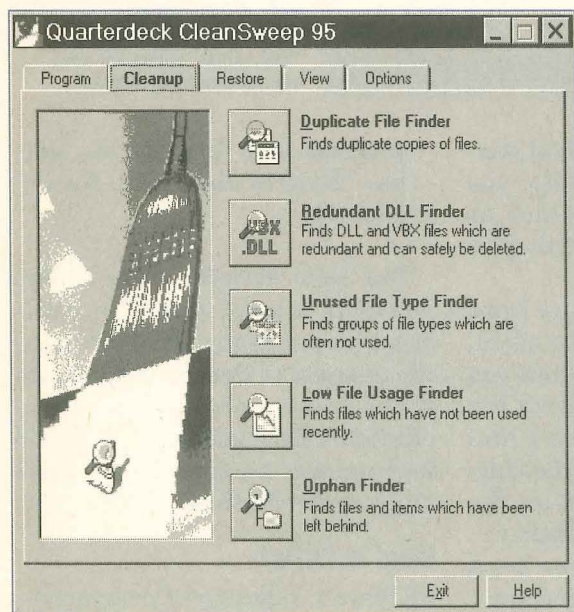


Photo 7. CleanSweep provides several options that let you analyze your hard drive for deadwood.

of them accessories, that you can dump if you don't use them. **Table 3** (page 26) lists some of these files.

TIP #10 Get a deinstaller.

In the good old days, you could "uninstall" a program by deleting the contents of its subdirectory. But Windows programs have become much too complicated, installing files all over your hard drive and modifying system files.

Deinstalling a Windows program manually is foolish; you'll wind up with all sorts of

orphaned files whose purpose will be a complete mystery to you.

The solution is to get a good uninstaller program such as Quarterdeck's CleanSweep. An uninstaller package monitors the files a new program installs, including the support files that program tucks away in your Windows subdirectories. When you want to remove the program, the uninstaller package makes sure that all those support files are purged, too.

Keep in mind that many uninstaller packages can do more than simply get rid of programs. CleanSweep, for example, also includes a variety of options that let you analyze your hard drive for unused, underused, and orphaned files. **Photo 7** (left) shows some of the choices CleanSweep provides. ■

Easy as 1-2-Zip

PKZip has become the de facto standard for file compression. Here's how it works, along with a few creative zipping recipes.

by John E. Simpson

It seems that no matter how big your hard drive is and how carefully you remove unwanted files, you never have enough disk space. Your data and documents are always scrambling for room, and you're continually shuffling them as you try to find a spot for your new programs and freshly downloaded software.

Surely you can do *something* to stave off buying an even bigger hard drive for just a few more months. You can indeed—thanks to PKWare's ubiquitous **PKZip**, the PC world's most popular file-compression program.

If you're a Windows user, you can also choose between two products that follow the PKZip standard: Nico Mak's **WinZip** or PKWare's new **PKZip for Windows**.

If you've downloaded much software from bulletin boards, commercial on-line information services, or the Internet, you're already familiar with PKZip. Nearly everyone uses it to compress files, permitting faster (and, therefore, cheaper) file transfers. But have you considered PKZip as a solution to your disk-cram problems? With a little bit of planning and organization up front, you can use it in any of the following ways:

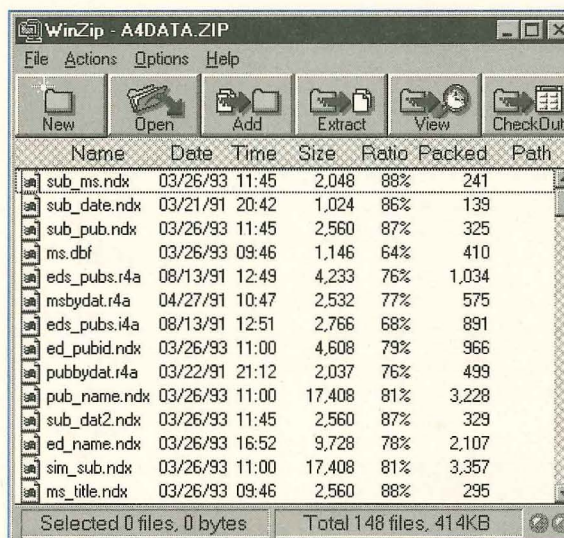


Photo 1. Nico Mak's WinZip for Windows 95, showing the contents of the A4DATA.ZIP file. All kinds of useful information is displayed here, including the compressed files' names, date/time stamps, and original and packed sizes. Note the differences in compression ratios, attributable to how many "redundant" strings of data the various files contain.

- to zip data files for archival storage on floppies. Typically, you can fit two to three times as many files on a disk if they're compressed.
- to zip programs on your hard drive that you don't use often, and unzip them only when you need them. A simple batch file can automate the zipping and unzipping process. (See the sidebar "File Compression on the Fly," page 38, for an example.)
- to zip data files on your hard drive to which you need only occasional access.
- to zip groups of small files into logical categories (for example,

program help files; see the sidebar "Help Is Just a Zip Away," page 34).

But how exactly does PKZip work? Is it safe? And how much space do you really save? Knowing the answers to these questions will make you a more confident and effective PKZip operator, and you'll find yourself using your hard drive much more effectively.

What Is PKZip?

PKWare's collection of programs—all named PK-something, such as PKZip, PKUnzip, and so on—is based on a compression scheme

TABLE 1: COMPRESSION RATES

Sample results of compressing various types of files. All sizes are in bytes.
Results will vary depending on the content of the files.

Type	Original	Compressed	Reduction
text	202,252	55,285	73%
DLL	26,560	12,380	53%
EXE	109,056	87,236	20%
DBF	92,170	20,957	77%
XLS	40,960	11,616	72%

patented by Phil Katz (the company's founder—hence the *PK*) in the 1980s. PKZip was not the first data-compression program available for PCs; ARC, from System Enhancement Associates, preceded it in popularity and is still used today. But its efficiency and ease of use quickly made PKZip number one in its class. If you download a lot of shareware, you won't get far without PKZip.

The idea behind PKZip and other compression utilities is simple: Eliminate redundancy. Take this article, for example. If you could replace the word *compress* everywhere it appears with a short string of bytes unlikely to have any real meaning—*C%*, for example—you'd have the beginning of a simple compression algorithm. The word *compression* would be represented as *C%ion*, *compressed* would be *C%ed*, and so on, and the resulting article would chew up that much less space on disk.

You could take it further, representing characters that appear more than twice in a row with a single occurrence of the character, followed by a byte containing the number of repetitions. Blank spaces in some contexts are a good example of this: To indent something five spaces, for example, your compression program might replace the blanks with something like *&5* (assuming that an amper-

sand followed by an integer is your code for repeated blanks).

PKZip and other compression programs are much more sophisticated than these trivial examples demonstrate. A variety of complex mathematical schemes—many of them patented—analyze a file, looking for repeated strings of bits and replacing them with shorter “synonyms.” So you end up with a file taking up vastly less space than the original.

On the other end of a compression scheme is a decompression program: one that converts the

compressed file back into usable form. PKZip's decompressor is called PKUnzip. A decompression program's most important feature is accuracy: The decompressed file has to be a replica of the original file.

In the example described above, for instance, if the article really contains the string *C%* (which, of course, it does—four times so far), the decompression program needs to know that it should avoid converting that occurrence to the word *compress*, but instead take the string literally.

It's true that in six years of using PKWare's products I've never seen PKUnzip unable to restore the contents of a zipfile (except in obvious cases such as damaged floppies or interrupted downloads). Of course, I've never been struck by lightning, either—but that's not to say it can't happen. See the discussion of the program PKZipFix (page 35) for more information about PKWare's solution for potential zipfile corruption.

AUTOMATED ZIPPING WITH WORD FOR WINDOWS

WordZip, a shareware utility, lets you save to and retrieve from zipped archives. The program works by adding Open from Zip and Save in Zip options to Word for Windows' File menu. For example, to save a document in a zipped archive, you choose File/Save in Zip instead of File/Save. A third option, Delete Document, lets you erase a file from the archive. The ostensible advantage of the WordZip add-on is that your Word documents take up less disk space in compressed format. But there's a hitch: WordZip's files, along with the required file VBRUN300.DLL, consume about 900K of space. If your documents are compressing at an average of 70 percent, you'll need to zip some 3MB of Word documents before you break even. Thus, WordZip is practical only if you're storing large documents or many small ones.

WordZip is free to registered users of ZipServer, a development tool that lets programmers integrate PKZip functions into their applications. ZipServer is \$39.50 for single users. For more information, contact REDEI Enterprises, 1424 Brett Place, Suite 359, San Pedro, CA 90732 (CompuServe: 71744,3633).

—Eric Maloney

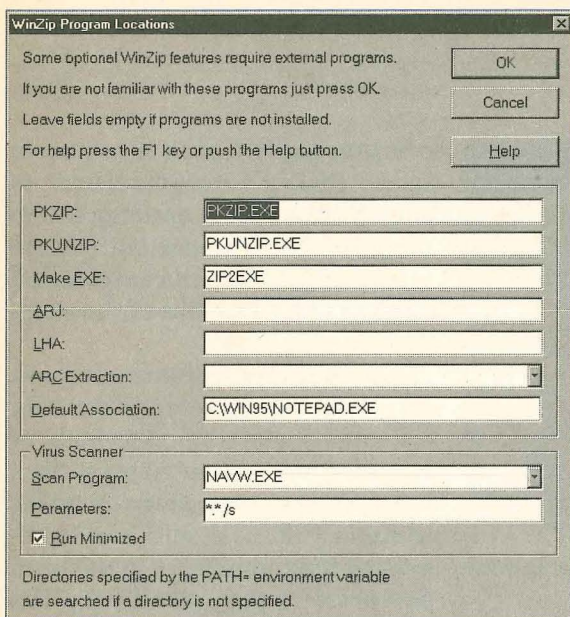


Photo 2. WinZip's Program Locations dialog. You don't need PKZip and PKUnzip to compress and decompress ZIP files with WinZip unless you need certain of the PK products' special features, such as disk spanning.

How much space do you save? Your mileage may vary depending on the kind of data you're compressing. Files consisting mostly of text—word-processing documents, spreadsheets, and database files—usually have a high degree of redundancy (or empty space), so they compress best.

Binary files (such as program files and files already compressed) generally squeeze less effectively. **Table 1** (page 31) shows sample compression rates for files of various kinds. Note that the text file, though a bit bigger than the DLL (dynamic link library) file, compresses much more tightly.

Inside PKZip

In their DOS forms (see the sidebar opposite for information on PKZip for Windows, released this past February), PKWare utilities use a plethora of single-letter command-line switches to control their behavior. In fact, current versions of the programs offer so many optional functions that the company has had to resort to nonalphanumeric characters. Here's the basic PKZip command:

```
PKZIP zipfile.ZIP file1
file2 file3 ...
```

Zipfile is the name of the output file, the one you're packing like a suitcase. (Adding the ZIP extension in the command line is optional; if you leave it off, PKZip will add it for you.) *File1*, *file2*, *file3*, and so on are the input files: the data you're stuffing into the luggage.

Note that you can use wildcards in any of these input-file specs; for example, this PKZip command:

```
PKZIP JESFILE *.DOC
READ*.*
```

produces a file called JESFILE.ZIP, containing all files in the current directory with a DOC extension plus README.TXT, README.1ST, README, and so on. You can also include paths for the zipfile, as well as for the inputs, if you want to refer to any directories other than the current one.

If that's all you ever learn about using PKZip, you'll be ready to handle most of the occasions on which you'll need it. Nevertheless,

among those dozens of command-line switches are a few jewels you might want to take a look at. Options appear before the zipfile's name on the command line, as in this example:

```
PKZIP -R *.DLL
```

Among the most useful switches are the following; note that all options are preceded by a hyphen:

- **-H.** Help switch; entering PKZIP -H lists all PKZip command-line switches and their functions.
- **-R.** Recurses the directory structure. That is, PKZip searches not only the current directory, but all subdirectories as well, for files matching the input file's specs.
- **-P.** Preserves the directory structure for files whose paths are specified on the command line. Together with the R option (use -RP), this one tells PKZip to keep all subdirectories and their files. When you unzip the ZIP file (using PKUnzip's -D option) PKUnzip restores the original directories and files.
- **-&.** The ampersand switch creates a "spanned" archive. Even with compression, some zipped files are just too big to fit on a floppy disk; spanning lets the file

PRODUCT INFORMATION

PKZip 2.04g, \$47
PKZip for Windows 1.0, \$49
 PKWare

9025 North Deerwood Drive
 Brown Deer, WI 53223
 414-354-8699

CompuServe: **75300,730**
 Internet: PKWARE,Inc@mixcom.com
 Web site: <http://www.pkware.com>

All PKWare products are shareware, available from on-line services around the world, including the Internet, CompuServe, America Online, and many BBSes. The registered version of PKZip for DOS includes PKUnzip and a variety of other PKWare utilities, such as Zip2Exe.

WinZip 6.1, \$29
 Nico Mak Computing Inc.
 P.O. Box 919
 Bristol, CT 06011

800-242-4775 (Public Software Library)
 CompuServe: **70056,241**
 CompuServe Forum: **GO WINZIP**
 Internet: nicomak@winzip.com
 Web site: <http://www.winzip.com>

WinZip, like the PKWare family of products, is shareware and available on line almost anywhere.

cross more than one floppy if necessary. PKZip will even format the floppies on the fly if they're not formatted already, so you don't need to know in advance just how many to format.

Note, by the way, that PKZip doesn't delete the original input files on its own. To do that, use the -M (move) switch. Otherwise, if you really want to keep just the compressed file from that point on, you'll have to delete the original files manually, using DOS's DEL command, Windows 3.1's File Manager, or Windows 95's Explorer.

When you're ready to unzip the file, you'll find that PKUnzip uses much the same command syntax.

The basic format is as follows:

```
PKUNZIP zipfile.ZIP file1 file2
      file3 ...
```

As with the PKZip command, *zipfile* is the name of the compressed (archive) file, and the ZIP extension is optional. In this case, though, *file1*, *file2*, *file3*, and so on are also optional. If you don't enter any of them, PKUnzip decompresses the entire zipfile. If you enter one or more of them, only the files you specify are decompressed.

Here are some useful PKUnzip options. As with PKZip, options appear on the command line after the command itself, before any file specifications:

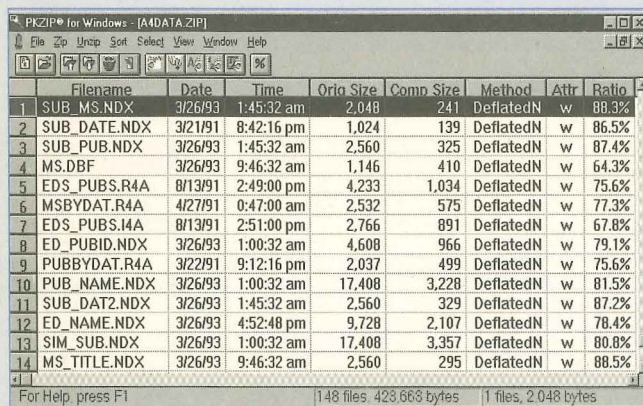
- **-H.** Again, this is the "help" option that lists all PKUnzip command-line switches and what they mean.
- **-D.** This switch restores the directory structure of the zipped files. If the paths (stored with PKZip's -P option) don't exist, PKUnzip creates them before unzipping the files themselves.
- **-T.** This option tests the integrity of the zipfile—that is, confirms that the files were zipped correctly.
- **-O.** If the file you want to extract already exists in the target directory, this option forces PKUnzip to overwrite it. If you don't specify this option, whenever a match-

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PKZIP FOR WINDOWS COMES UP SHORT

PKWare finally released PKZip for Windows, its first Windows product, in February. **Photo 1** shows you PKZip for Windows' view of the same archive displayed by Nico Mak's WinZip in **Photo 1** of the main article.

PKZip for Windows is a graphical front end that performs all the functions on which users of the DOS product line have come to rely. As you can see in **Photo 2**, the command-line alphabet soup has been replaced by a series of panels filled with radio buttons and check boxes; you just click on the options you want for the specified zipfile.



	Filename	Date	Time	Orig. Size	Comp. Size	Method	Attr	Ratio
1	SUB_MS.NDX	3/26/93	1:45:32 am	2,048	241	DeflatedN	w	88.3%
2	SUB_DATE.NDX	3/21/91	8:42:16 pm	1,024	139	DeflatedN	w	86.5%
3	SUB_PUB.NDX	3/26/93	1:45:32 am	2,560	325	DeflatedN	w	87.4%
4	MS.DBF	3/26/93	9:46:32 am	1,146	410	DeflatedN	w	64.3%
5	EDS_PUBS.R4A	8/13/91	2:49:00 pm	4,233	1,034	DeflatedN	w	75.6%
6	MSBYDAT.R4A	4/27/91	0:47:00 am	2,532	575	DeflatedN	w	77.3%
7	EDS_PUBS.I4A	8/13/91	2:51:00 pm	2,766	891	DeflatedN	w	67.8%
8	ED_PUBID.NDX	3/26/93	1:00:32 am	4,608	966	DeflatedN	w	79.1%
9	PUBBYDAT.R4A	3/22/91	9:12:16 pm	2,037	499	DeflatedN	w	75.6%
10	PUB_NAME.NDX	3/26/93	1:00:32 am	17,408	3,228	DeflatedN	w	81.5%
11	SUB_DAT2.NDX	3/26/93	1:45:32 am	2,560	329	DeflatedN	w	87.2%
12	ED_NAME.NDX	3/26/93	4:52:48 pm	9,728	2,107	DeflatedN	w	78.4%
13	SIM_SUB.NDX	3/26/93	1:00:32 am	17,408	3,357	DeflatedN	w	80.8%
14	MS_TITLE.NDX	3/26/93	9:46:32 am	2,560	295	DeflatedN	w	88.5%

For Help, press F1 148 files, 423,663 bytes 1 files, 2,048 bytes

Photo 1. PKZip for Windows' main window. Compare with **Photo 1** in the main article, which shows the same zipfile. There's a bit more technical information here, such as the compression method used. Also note that WinZip and PKZip for Windows report slightly different compression ratios; that's not a sign that they won't process the zipfiles identically, but rather reflects minor differences in their compression/decompression algorithms.

Reservations about the new release? Well, it's pretty bare-bones: you can't do anything with it you couldn't do with the DOS program. Notably, it handles no compression formats other than ZIP, and it doesn't support drag-and-drop actions. And there's no automatic virus-checking capability.

PKZip doesn't have a 32-bit version ready yet, although under Windows 95 PKZip for Windows does offer limited support for long filenames. Long filenames are stored in the zipfile, but all dialog boxes display the short versions—horrible tildes and all.

Bottom line? Perhaps too little too late.

—J.E.S.

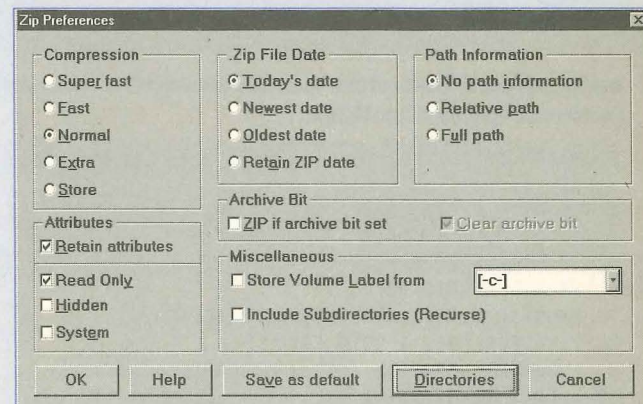


Photo 2. PKZip for Windows Preferences panel. The check boxes and radio buttons here are graphical counterparts of the DOS PKZip's Byzantine collection of command-line switches.

HELP IS JUST A ZIP AWAY

If you've collected a number of freeware, shareware, and batch files, you probably also have documentation files scattered all over your hard drive. They're not always easy to find, and they probably take up excessive drive space. Wouldn't it be easier to put all these docs into a single help file, which you could then access as you do Help for DOS commands? The batch file HLP.BAT uses PKZip to do just that.

Let's say, for example, that your file-find utility, called Searcher, comes with a text file containing instructions for using the program. Just type:

```
HLP SEARCHER
```

and HLP.BAT displays those instructions. The batch file retrieves the documentation from a file called HLP.ZIP, which you create with PKZip.

The first step is to create the archive. Add each text file you want to place into HLP.ZIP with the following command, where *filename.TXT* is the name of the text file you're adding:

```
PKZIP C:\UTILS\HLP.ZIP [filename.TXT]
```

To make your life easier, rename each documentation file so that it matches the name of the program. For example, if the documentation file for Searcher is README.TXT, rename README.TXT as SEARCHER.TXT.

In the version shown in the accompanying program listing, each file must have the extension TXT. If you want to use another extension, change the appropriate references in the listing.

The above example puts HLP.ZIP into the subdirectory \UTILS, but you can put it into any subdirectory. Change the subdirectory references in the listing, as well.

Whatever directory you use, make sure there's no chance of a filename in HLP.ZIP duplicating a filename in the directory. Otherwise, the file you're unzipping will overwrite the existing file.

To prepare HLP.BAT, type in the code as it appears in the accompanying program listing, minus the line numbers. Line 28 contains the names of the files in HLP.ZIP; replace the examples with your own filenames. Save the batch file in a subdirectory to which your AUTOEXEC.BAT's PATH statement refers. Make sure that PKUnzip is in a subdirectory also listed in your PATH statement.

Running HLP.BAT is simple. If you type HLP by itself, or HLP followed by one of the switches in lines 3 through 6 (/?, ?, /H, or H), HLP.BAT jumps to the :HELP subroutine beginning at line 18. The subroutine displays the proper syntax and lists the files in HLP.ZIP.

If you type HLP followed by the name of a file in HLP.ZIP, line 7 decompresses the file with PKUnzip. Don't include the extension TXT; HLP.BAT attaches it automatically to the filename.

Line 11 uses DOS's MORE command to list the file. (If you've got a favorite file viewer, substitute it in this line.) The command is the same as this one:

```
TYPE C:\UTILS\%1 | MORE
```

The MORE command doesn't give you the chance to scroll back and forth through the documentation. If this ability is important to you, replace line 11 with line 10, which loads the help file into the DOS text editor Edit. If you use Edit to view your help files, remember that any changes you make to the document won't be saved to HLP.ZIP. Once MORE finishes paging through the help file (or, if you're using Edit, you exit the program), HLP.BAT deletes the help file and exits to the DOS prompt.

Remember that when you add files to HLP.ZIP, you must also add the filename to the ECHO statements in lines 26 through 29.

—Frederick L. Sohn

This batch file appeared originally in the January 1996 issue of DOS World (page 14).

—Eds.

Use HLP.BAT and PKZip to put your shareware documentation into one convenient help file for easy access. Note that line numbers are for reference only; don't type them in.

```
1 @ECHO OFF
2 IF "%1"==" " GOTO HELP
3 IF %1==/? GOTO HELP
4 if %1==? GOTO HELP
5 if %1==/H GOTO HELP
6 if %1==H GOTO HELP
7 PKUNZIP C:\UTILS\HLP %1 C:\UTILS>NUL
8 IF ERRORLEVEL 1 GOTO ERR
9 ::Better than the following MORE command is:
10 ::EDIT C:\UTILS\%1
11 MORE<C:\UTILS\%1
12 DEL C:\UTILS\%1>NUL
13 GOTO END
14 :ERR
15 ECHO ERROR: Can't find %1 in C:\UTILS\HLP.ZIP.
16 PAUSE
```

```
17 GOTO HELP
18 :HELP
19 CLS
20 ECHO.
21 ECHO.
22 ECHO HLP.BAT 2.30 F.L. Sohn 8/16/95
23 ECHO.
24 ECHO Enter "HLP [topic]" to run:
25 ECHO
26 ECHO ANSI BOOT DRVLOAD DRVTYPE FGREP
27 ECHO FINDIRQ FM FV LOOK MARK
28 ECHO MCOPY PERUSE PORTAL PREFIX READ
29 ECHO SHRED STACKCHK
30 ::Replace the HLP.ZIP files in lines 26-29 with
31 ::the names of your own HLP.ZIP files.
32 :END
```

End

continued from page 33

ing filename is about to be extracted, PKUnzip issues a warning message and asks whether you want to overwrite it. (The utility also offers another option, -O-, which tells PKUnzip never to overwrite a matching filename.)

With PKZip and PKUnzip, you can handle almost all common data-compression chores. (See **Table 2**, below, for examples.) Some other PKWare products are also useful. **Zip2Exe**, for example, turns a zipfile into a self-extracting archive with an EXE extension.

For example, if you plan to pass a passel of spreadsheets to a colleague who may not have PKUnzip, you turn WK4FILES.ZIP into WK4FILES.EXE. Your colleague types WK4FILES, and the program decompresses the spreadsheets.

Nervous about the prospect of your valuable zipped data becoming "unzippable"? PKWare includes with the basic Zip/Unzip utilities another one call **PKZipFix**, which repairs the file indexes with which

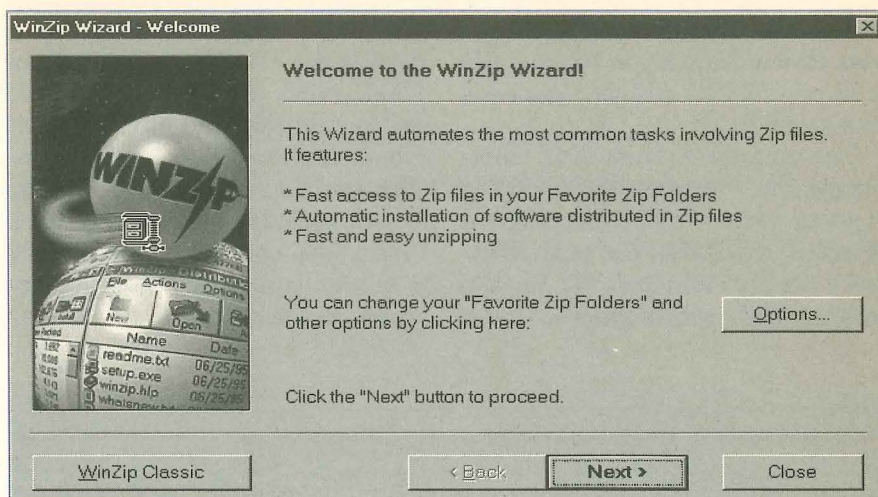


Photo 3. With the recent release of Nico Mak's WinZip 6.1, you may choose either the "classic" WinZip interface (as shown in Photo 1) or a new wizard—a series of dialog boxes that walk you painlessly through the zipping/unzipping processes.

PKZip works some of its magic. It's true that ZipFix can't restore a file when the storage medium is itself severely corrupted—it can't work miracles—but it's a great safety net should you need one.

PKing Through Windows

One of the most interesting features of PKWare's product line is that while the zipping and unzipping algorithms are patented, PK-

Ware has placed the file formats in the public domain. Thus, a cottage industry of zipping and unzipping utilities has sprung up over the years, all of them compressing and decompressing files that can be decompressed and compressed by all the others.

Because all of PKWare's products have been DOS utilities, many of these competing products have focused on adding menus and

TABLE 2: SAMPLE COMMANDS

COMMAND	PURPOSE
PKZIP -M C:\ARCHIVE\DOCS.ZIP *.DOC	puts current directory's DOC files into DOCS.ZIP in C:\ARCHIVE directory and deletes files
PKZIP -SPSWD SECRET.ZIP LOVELETT.DOC	compresses the file LOVELETT.DOC into a file called SECRET.ZIP and encrypts it with the password PSWD (can't be extracted without the password)
PKZIP -&M A:\ARCHFILE.ZIP *.PCX	compresses all PCX files in the current directory into the ARCHFILE.ZIP file in the root directory of floppy-drive A, spanning more than one floppy if necessary, and deletes the PCXes when done
PKZIP -D MANYFILE.ZIP JUNK.TXT	deletes the compressed file JUNK.TXT from MANYFILE.ZIP
PKUNZIP TEXTFILE.ZIP README.TXT	extracts from TEXTFILE.ZIP only a single file, README.TXT
PKUNZIP -SPSWD SECRET.ZIP LOVELETT.DOC	uses the password PSWD to extract the encrypted LOVELETT.DOC file from SECRET.ZIP
PKUNZIP -VMN *.ZIP	lists contents of all ZIP files in alphabetical order, pausing after each full screen
PKUNZIP -VMN *.ZIP R*.*	same as above, but lists only filenames beginning with the letter R

graphical interfaces. If nothing else, that cuts down on the number of command-line switches you need to remember.

One company, Nico Mak Computing Inc., has developed a set of zipping tools for Windows, called WinZip, available for both Windows 3.x and Windows 95. WinZip meshes nicely with Windows. Under

Windows 3.x, for example, it adds itself to the File Manager menu. In Windows 95, you'll find a new Add to Zip subcommand on Explorer's File menu, as well as on the right-click shortcut menu. Also, WinZip is completely compatible with PKZip. You can use either product to manipulate zipped files you created with the other.

Whichever version of WinZip you use, the interface is similar. (See **Photo 1**, page 30, which shows WinZip for Windows 95 with a zip-file open.)

Here's the basic layout: Along the top, beneath the menu bar, you'll find a row of buttons for performing the most common WinZip operations: preparing a new zipfile;

USING PKZIP WITH YOUR DOS TEXT EDITOR

If you use a DOS text editor such as DOS Edit or Xywrite, you can create a simple batch file that not only stores your documents in a zipped file but automatically extracts them and loads them into your editor as well. The accompanying batch file, PKEDIT.BAT, offers a simple example.

PKEdit lets you store your documents in a zipped file called DOCS.ZIP. You can extract, edit, and resave your documents in DOCS.ZIP without remembering and typing the necessary PKZip commands. I've used DOS's Edit program here to demonstrate the batch file, but you can substitute any DOS editor that accepts a filename as a command-line parameter.

Here's how PKEdit works. To open an existing file or create a new file, type:

```
PKEDIT filename
```

PKEdit checks DOCS.ZIP for a matching file. If it finds one, it runs Edit and opens the specified file for editing. If the file doesn't exist, PKEdit asks whether you want to create it. Answer N to exit to DOS; answer Y to run Edit and create the new file.

When you're done editing the file, save it and exit Edit. PKEdit automatically stores the revised or new file in DOCS.ZIP. It also automatically creates DOCS.ZIP if the file doesn't exist yet.

If you want help or need a list of files in DOCS.ZIP, type PKEDIT without any parameters. PKEdit displays a brief help screen and gives you the chance to look at a list of DOCS.ZIP's contents.

To work properly, PKEdit requires the following conditions:

- that you store your documents in DOCS.ZIP
- that DOCS.ZIP be in a subdirectory called DOCS
- that PKEDIT.BAT be in a directory included in your PATH statement
- that PKZip and PKUnzip are in a directory included in your PATH statement

The batch file first checks to see whether you typed a filename. If PKEdit finds none, it jumps to the HELP subroutine and exits to DOS. Otherwise, PKEdit moves on to the CHECK subroutine, which looks in DOCS.ZIP to find out whether the string

you've typed at the command line exists. The process involves several steps. First, this command:

```
PKUNZIP -@C:\DOCS\LISTFILE C:\DOCS\DOCS.ZIP>NUL
```

creates a data file called LISTFILE, containing a list of the files in DOCS.ZIP. The next line uses the DOS Find command to search LISTFILE for a match with the string you specified. If it can't find a match, it jumps to the subroutine NOMATCH and

PKEDIT.BAT automates the process of opening, editing, and zipping documents. Note that line numbers are for reference only; don't type them in.

```
1 @ECHO OFF
2 CLS
3 IF "%1"==" " GOTO HELP
4 ::
5 ::Check for valid filename in DOCS.ZIP
6 :CHECK
7 PKUNZIP -@C:\DOCS\LISTFILE C:\DOCS\DOCS.ZIP>NUL
8 FIND /I "%1" C:\DOCS\LISTFILE>NUL
9 IF ERRORLEVEL 1 GOTO NOMATCH
10 PKUNZIP C:\DOCS\DOCS %1 C:\DOCS
11 IF ERRORLEVEL 11 GOTO NOMATCH
12 GOTO EDIT
13 ::
14 ::Choices if the specified file doesn't exist
15 :NOMATCH
16 ECHO %1 doesn't exist. Do you want to create it?
17 CHOICE
18 IF ERRORLEVEL 2 GOTO CLOSE
19 IF ERRORLEVEL 1 GOTO NEW
20 ::
21 ::Create new file
22 :NEW
23 EDIT C:\DOCS\%1
24 CLS
25 GOTO UPDATE
26 ::
27 ::Edit existing file
28 :EDIT
29 EDIT C:\DOCS\%1
30 CLS
31 ::
32 ::Update DOCS.ZIP when done editing document
```


opening an existing zipfile; adding files to a zipfile; extracting files from a zipfile; and viewing a file without extracting it (handy for text files).

The WinZip toolbar also includes an interesting feature called "check out." This button lets you not only extract the contents of a zipfile but build a Windows program group

around them, one icon per file. You can thus review extracted files without having to resort to Windows' File Manager or Explorer.

If processing zipfiles were all WinZip did, it would be just a pretty cosmetic face laid on top of the file structure. But Nico Mak has taken the idea quite a bit further. In the first place, WinZip supports

native Windows drag-and-drop operation. Got a Word document in a zipfile? Select it and drop it directly into Word.

Drag-and-drop works the other way, too; if you select a file in Win95's Explorer, for example, you can simply drag it to the WinZip icon to add it to a new or existing archive.

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exits the program. The next line extracts the file into the DOCS directory. This is a temporary file that PKEdit will delete when you're done.

Note that PKEdit doesn't check to see whether the DOCS subdirectory already contains a file of the same name. If so, PKZip asks whether you want to overwrite the existing file with the extracted file. Choose either N (no) or A (abort). Don't choose R (rename); PKEdit will rename the file you're extracting in

```

33 :UPDATE
34 PKZIP -M C:\DOCS\DOCS C:\DOCS\%1>NUL
35 GOTO CLOSE
36 ::
37 ::List files in DOCS.ZIP
38 :LIST
39 CLS
40 PKUNZIP -V C:\DOCS\DOCS | MORE
41 GOTO CLOSE
42 ::
43 ::Help screen
44 :HELP
45 IF "%1"==" " ECHO No file specified.
46 ECHO.
47 ECHO To open an existing file or create a new
    file, type
48 ECHO.
49 ECHO ZEDIT filename
50 ECHO.
51 ECHO.
52 CHOICE /C:LX /n Press L for list of files, X
    to exit to DOS
53 CLS
54 IF ERRORLEVEL 2 GOTO CLOSE
55 IF ERRORLEVEL 1 PKUNZIP -VB C:\DOCS\DOCS |
    FIND "%%" | MORE
56 ::
57 ::Delete LISTFILE, exit to DOS
58 :CLOSE
59 IF EXIST C:\DOCS\LISTFILE DEL
    C:\DOCS\LISTFILE>NUL

```

End

DOCS.ZIP and open the existing file. When you exit Edit, PKEdit will overwrite the file in DOCS.ZIP with the existing file.

If you're comfortable with DOS's batch-file language, you might consider writing a routine that checks for an existing file and renames it before extracting the zipped file. Otherwise, make sure you don't store in the \DOCS subdirectory any documents that might have the same filenames as documents in DOCS.ZIP.

The ERRORLEVEL check following the file extraction exists to overcome a weakness in the Find command. Find returns partial matches as well as complete ones. For example, if DOCS.ZIP contains a file called LETTER1.DOC and you type PKEDIT LETTER at the command line, Find returns a match. PKZip dutifully tries to extract the nonexistent LETTERS from DOCS.ZIP, fails, and exits. ERRORLEVEL traps the exit code (11), assumes that you want to create a new file, and goes to the subroutine NOMATCH (more on NOMATCH in a minute).

If all goes well and DOCS.ZIP contains the specified file, PKEdit branches to the EDIT subroutine, runs Edit, and opens the extracted file. When you're done editing the file and exit Edit, PKEdit picks up where it left off, moving on to the UPDATE subroutine, which returns the updated file to DOCS.ZIP. The -M switch tells PKZip to delete the extracted file.

Back to NOMATCH. If the filename you specified doesn't exist, the NOMATCH subroutine asks whether you want to create it. If you simply typed a wrong filename, choose N, and PKEdit goes to the CLOSE subroutine. If you want to create the new file, answer Y; PKEdit jumps to the NEW subroutine, which runs Edit and opens the new document automatically. After you've saved the file, PKEdit branches to the UPDATE subroutine, zips the file, and deletes it.

PKEdit is a no-frills batch file offering several opportunities for enhancement. For example, you might want to modify it to handle several zipped files, such as LETTERS.ZIP, MEMOS.ZIP, and REPORTS.ZIP. A simple menu would let you choose from a list of zipped files or search all files for a specified filename. Still another useful addition would be a deletion routine to get rid of files in DOCS.ZIP.

—Eric Maloney

FILE COMPRESSION ON THE FLY

While I was doing some hard-drive maintenance recently, I noticed that even with a hard drive of more than 200MB, my free space was getting low. I started looking at the directories and saw that many of them contained programs I seldom used.

A friend at work was using PKZip to compress files and save some room. That gave me the idea of using PKZip as a kind of poor man's disk-compression system. So I wrote a set of batch files to archive my seldom-used programs and extract them only when I need them.

ZIPDIR.BAT runs PKZip on your default directory; RUN.BAT uses PKUnzip to decompress the directory and then runs the program; DONE.BAT updates the file and clears the directory when you exit the program.

Once you've created these batch files, place them in a directory included in your PATH statement. The PKZip and PKUnzip programs should also be in a directory that exists in the drive path.

ZIPDIR.BAT places all zipped directories in a subdirectory named \ZIPFILES. This batch file also creates a GO.BAT file, which it places in the default directory before zipping. RUN.BAT unzips that file to a subdirectory named RUNFILES. If these directories don't exist, the batch files create them.

Before you compress a directory, clean it up. Remove any unnecessary printer drivers, graphics drivers, and READ.ME or text files.

Run ZIPDIR.BAT from within the directory you want to compress. The correct command syntax is as follows:

```
ZIPDIR zipfilename runfilename
```

You don't need to use extensions for COM, EXE, and ZIP files. *zipfilename* is the name you'll want to use later to call your program; *runfilename* is the program in that directory that runs after the files are extracted.

ZIPDIR checks for both parameters, then that *zipfilename* doesn't already exist and that it's not in an empty subdirectory. It looks for the program name you gave it and creates a GO.BAT file in that directory to run the program; upon exiting the program, ZIPDIR runs the DONE.BAT file to clean up. It creates the \ZIPFILES directory if necessary and then runs PKZip on that directory. After you test the program with RUN.BAT, you may delete the original directory.

RUN.BAT is the batch file that finds your compressed directory, places it in the RUNFILES directory, and runs the GO.BAT file. If you call it with no parameter, it checks for an existing program there and runs it.

If you plan to use the program later, answer N to the "delete files" prompt when you exit. If you call it with a parameter, the format is RUN *zipfilename*, which then checks the RUNFILES directory for files and asks you for the okay to delete them before loading the new program.

RUN.BAT then unzips the file, checks for a valid GO.BAT, and runs it. You may edit the GO.BAT file and add program parameters to its first line.

DONE.BAT runs automatically when you exit the program. It updates *zipfilename* with any changes you, or the program, made during that session. You have the option of clearing the directory if you don't plan to return to this program later.

You can keep your data files in the compressed program directory. I keep my data files in separate subdirectory, which makes them easier to find and back up.

After using these batch files for a few months, my \ZIPFILES directory is a little more than 22MB; I've freed up more than 28MB. Compression percentages will vary, depending on different program and data types.

Some programs give you the option of running in a single directory or creating subdirectories under the main directory. You can modify these programs to recurse subdirectories by changing the PKZIP and PKUNZIP parameters. For most people, the existing files will work fine.

—Ben Martnick

ZIPDIR.BAT runs PKZip on your default directory.

```
@ECHO OFF
REM == ZIPDIR.BAT ==
:CHECKPARM
IF %1. == . GOTO USAGE
IF %2. == . GOTO USAGE
:CHECKZIP
MD \ZIPFILES
IF NOT EXIST \ZIPFILES\%1.ZIP GOTO CHECKFILES
@ECHO %1.ZIP already exists!
@ECHO.
GOTO END
:CHECKFILES
IF EXIST *.* GOTO CHECKGO
@ECHO No files in this directory to zip!
@ECHO.
GOTO USAGE
:CHECKGO
IF NOT EXIST %2.* GOTO USAGE
@ECHO %2>GO.BAT
@ECHO DONE %1>>GO.BAT
:ZIP
PKZIP \ZIPFILES\%1 *.* -EX
GOTO END
:USAGE
@ECHO Usage: ZIPDIR zipfilename runfilename
@ECHO.
:END
```

End

RUN.BAT uses PKUnzip to decompress the default directory and runs the program.

```

@ECHO OFF
REM == RUN.BAT ==
MD \RUNFILES
CD \RUNFILES
IF EXIST %1.* GOTO RUN
IF NOT %1. == . GOTO CHECKDIR
IF EXIST *.* GOTO RUN
IF NOT EXIST *.* GOTO USAGE
:CHECKDIR
IF NOT EXIST *.* GOTO CHECKZIP
IF %CHECK% == Y GOTO USAGE
@ECHO Directory is not empty!
@ECHO You must clear the directory before you can run a new program.
@ECHO ON
ERASE \RUNFILES\*.*
@ECHO OFF
SET CHECK=Y
GOTO CHECKDIR
:CHECKZIP
IF EXIST \ZIPFILES\%1.ZIP GOTO UNZIP
@ECHO %1.ZIP not found!
@ECHO.
GOTO USAGE
:UNZIP
PKUNZIP \ZIPFILES\%1
:RUN
IF NOT EXIST GO.BAT GOTO NOGO
GO
:NOGO
ECHO NO GO.BAT file exists for this program!
@ECHO ON
ERASE \RUNFILES\*.*
@ECHO OFF
GOTO END
:USAGE
@ECHO Usage: RUN zipfilename
@ECHO.
:END
SET CHECK=

```

End

DONE.BAT updates the file and clears the directory when you exit the program.

```

@ECHO OFF
REM == DONE.BAT ==
MD \RUNFILES
CD \RUNFILES
PKZIP \ZIPFILES\%1 -U -EX
:DEL
@ECHO ON
ERASE \RUNFILES\*.*
@ECHO OFF
IF EXIST *.* GOTO GOBACK
GOTO END
:GOBACK
@ECHO Type run to return to %1 later
@ECHO.
:END

```

End

Now take a look at **Photo 2** (page 32), WinZip's Program Locations dialog. As you can see, the ZIP extension isn't the only DOS-based compression format WinZip can handle; it also processes ARJ, LHA, and ARC files. (You'll need proper supporting software from the vendors that sell compression utilities for these formats.)

WinZip also handles common Unix-based compression standards without using other software: TAR, GZ, TAZ, and TGZ. You'll find that these Unix formats are especially common on Internet sites.

Finally, as another boon to frequent downloaders, WinZip can automatically pass zipped files to your resident virus checker to scan for viruses.

The latest version of WinZip, release 6.1, includes a number of improvements, most notable of which is a WinZip wizard. (See **Photo 3**, page 35.)

The wizard simplifies handling zipfiles, particularly those including a SETUP.EXE file. For such archives, the WinZip wizard runs the setup program for you. It also gives you access to zipfiles by searching for the directories in which you've put them most often and recently.

With all these and other features built into WinZip, you might feel it's a no-brainer purchase: Why wouldn't you want something that makes archiving and compressing so simple?

Even with the release (at last) of a true Windows product from PKWare itself, I can think of only one reason not to spring for WinZip. PKWare still owns the zipfile format, so it's remotely possible that PKWare will put some spin on a future release of the underlying zip specification with which Nico Mak will need to play catch-up.

But whether you decide to play it 100-percent safe by sticking with the originator of the format or go with the worthy competitor, you need one or the other. ■

Tame Those Fonts

Too many typefaces can spoil performance. Find out what you can do to keep them from overrunning your computer and bogging things down.

by Hardin Brothers

My computer had all the symptoms of a serious problem: Windows and major applications loaded too slowly, the system was inexplicably running low on memory, and the hard disk was whirring too often, as Windows tried to swap enough data out to disk to fulfill my requests. In addition, one of my hard disks was almost full.

So I began taking inventory. What was Windows doing during sluggish boots? What was eating up my disk space? Why was I running out of memory?

When I typed DIR in my \WINDOWS \SYSTEM directory and almost 600 filenames scrolled up the screen, I suddenly realized that the problems weren't my computer's fault—they were mine.

I have to admit it: I'm a fontaholic. I tremble when I walk through the font section at Egghead, I've downloaded dozens of shareware and freeware font packages, and I've got a box full of floppies with fonts I may want to use "someday."

I thought I had my computer's fonts under control. After all, I had only a few extra TrueType fonts and a couple of Adobe Type Manager fonts installed. But as I began to look around, I found that "a few" was really more than 200. Clearly,

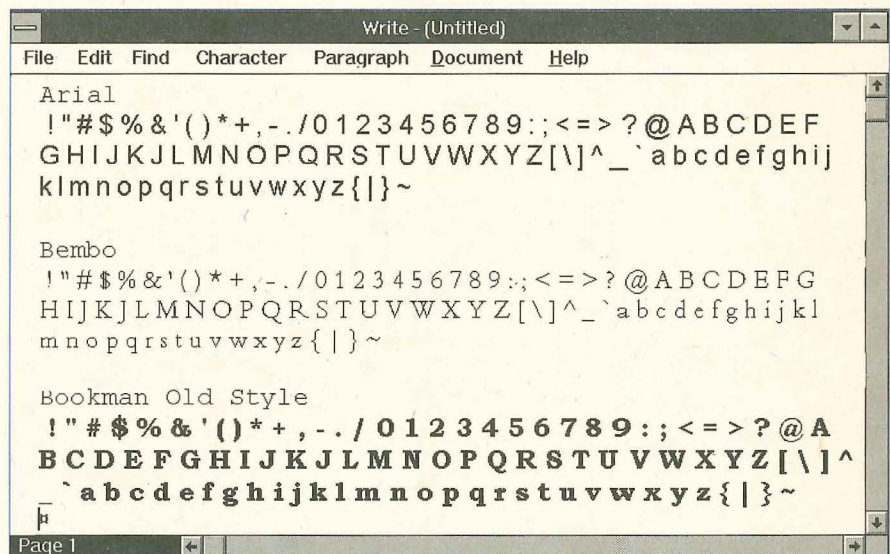


Photo 1. Creating a font library catalog with Write. Each available font is displayed in the catalog, which you should print for future reference.

all those fonts were bogging down my computer.

You may not have 200 fonts on your computer. You may not even have 100—yet. But if you can manage the fonts you do have, Windows 3.x will run faster and you'll suddenly have extra disk space. My fonts were taking up over 20MB of disk space—more than enough for a good-sized application. I managed to reclaim about 15MB of that space. But the real payoff is that Windows and several of my major applications now load twice as fast as they used to.

You can reap similar benefits if you follow my advice for trimming down Windows 3.x fonts. (For the rundown on important DOS and Windows 95 font issues, see the sidebars: "Tinkering with DOS Fonts," opposite, and "Font Management Under Win95," page 43.)

Understanding Fonts

Windows comes with three kinds of fonts: raster, vector, and TrueType. Normally, these fonts are installed with Windows. (See the accompanying table, "Fonts in Windows 3.1," page 42.)

Raster-font files contain a bit map, or pixel image, of each character in each available size. For example, the MS Serif font installed on my computer contains bit maps for each character in 8-, 10-, 12-, 14-, 18-, and 24-point sizes. (A point is about $\frac{1}{72}$ of an inch.) Windows can scale raster fonts to even multiples of their original sizes, but the results often look jagged. Raster fonts are fast, because Windows merely reads each character from a file; it doesn't have to perform any calculations to display a character.

Vector fonts (sometimes called plotter fonts) are stored as a series of pen strokes. The advantage of vector fonts is that they're easy to scale and rotate. Their disadvantage is that they require a relatively long time to render.

Finally, TrueType fonts, which were introduced with Windows 3.1, are fully scalable fonts. They're stored as a general outline along with "hints" for rendering each character at different sizes. They fall somewhere between raster and vector fonts in display speed, are easy to use and manipulate, and can be displayed on most output devices. Most importantly, they're WYSIWYG (what you see is what you get), which means that their screen and printed representations are almost the same.

By default, all font files on a Windows 3.x computer reside in the \WINDOWS\SYSTEM directory. The files for raster and vector fonts have the extension FON. Files for TrueType fonts usually carry the extension TTF. When you install a TrueType font, Windows creates a second, short information file for it and gives that file the extension FOT.

If your system has a couple hundred fonts installed, as mine did, your \WINDOWS\SYSTEM directory

will be awash in FON, FOT, and TTF files. You'll have a difficult time finding the things that should be in the system directory, including dynamic link library (DLL) files, device drivers, and other system-related files.

Cleaning Up

You can buy commercial programs to help you manage your fonts, but I decided to do it myself. Before I

started my spring cleaning, I made myself a catalogue of the fonts installed under Windows. I used a simple Microsoft Word for Windows macro, written in Word Basic, to print a sample of each font, but with patience you can do the same thing in Write.

Each sample consists of two paragraphs. The first contains the name of the font; the second contains a complete set of all char-

TINKERING WITH DOS FONTS

When you work in DOS, you'll encounter two types of fonts: text-mode display fonts and graphics-mode fonts. If you don't like the characters your VGA or EGA card generates on screen when you're working at the DOS prompt or in a text-based DOS program, you can load a different character set into the video adapter. The change doesn't show up on your printouts, but it can make characters easier to read on screen, especially if you regularly display more than 25 rows of text. Several shareware programs will load alternative text-mode fonts for you. One such program is CVFONT.ZIP, which is available in File Area 5 on the *DOS World* BBS. (See page 70 for dialing instructions.)

If you run DOS applications in a window under Windows 3.x or Windows 95, Windows, rather than your DOS program, chooses the text-mode display font. But if you don't like Windows' choice, you can adjust both the font and the size of the characters used in DOS windows. Just click on the Control icon (the hyphen button in the window's upper-left corner) and choose Fonts to peruse the choices and make a switch.

Graphics-mode fonts offer more variety, but you can't use them at the DOS prompt. Many DOS-based word processors and page-layout programs, however, support add-in font packages that let you display and print information in graphics mode. Some packages also support font cartridges for laser printers. When you use add-in fonts and font cartridges with these programs, you see the special fonts on screen and in your printouts.

What kind of performance penalty do you pay if you choose an alternative text-mode font or a graphics-mode font? Using a different VGA or EGA text-mode font doesn't slow down the computer at all. But the programs that load them are often memory resident, which means that you sacrifice a small amount of DOS memory. Although displaying text as graphics in a word processor is certainly slower than using DOS text mode, many DOS programs compensate by letting you work in the faster text mode and switch to graphics mode for a preview of the finished product. Each of these programs handles fonts in its own way; they don't slow you down when you work at the DOS prompt or in another DOS program.

Some DOS programs offering graphics-mode fonts, however, do require huge amounts of disk space to store those fonts, because they create bit maps of each character in each size ahead of time. They don't render fonts on the fly, as Windows does.

—H.B.

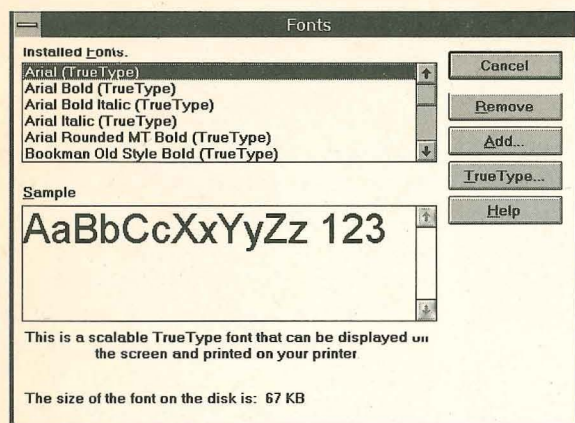


Photo 2. Opening screen of Control Panel's Fonts tool. Use this screen to select the fonts you want to remove, at least temporarily, from your system.

acters in that font. (See **Photo 1**, page 40.) If you make good use of the Clipboard's copy-and-paste feature and Write's Character/Font menu, it doesn't take long to catalog all your installed fonts. If you have a large font collection, though, you may want to create the catalog in several parts.

Print and save your catalog as a record of all fonts installed on your hard disk. After printing the catalog, go through it and mark the fonts you rarely use. Those are the ones you should deinstall, at least for the time being.

But before you make your final decision about which fonts to keep and which to deinstall, choose File/Run from Program Manager or File Manager, type SYSEDIT, and click on WIN.INI to bring this file to the top of the stack of Windows' system files. Look for the section titled [FontSubstitutes]; it tells Windows which fonts to substitute for other fonts. By default, Windows 3.1 creates a [FontSubstitutes] section that looks like this:

```

Helv=MS Sans Serif
Tms Rmn=MS Serif
Times=Times New Roman
Helvetica=Arial
    
```

The fonts on the left side of the equal signs are ones used in Windows 3.0 and programs written for it. Windows 3.1 doesn't use these

fonts, and these lines tell Windows which font to substitute if it receives a request to display one of these old fonts. Consequently, you shouldn't remove any font name that appears on the right side of an equal sign in that section.

Also make sure not to remove fonts with the extension FON. Windows uses many of those fonts for various system tasks, such as displaying menus and icon labels. If you remove them, you may completely destroy your Windows display.

How do you know which fonts carry a FON extension? Browse through the [Fonts] section in WIN.INI; it lists every raster, vector, and TrueType font installed on your computer.

Note that each line shows a font name and description, followed by an equal sign and the name of the font's FON or FOT file. If you like, you may move all entries containing FON files to the beginning or end of the [Fonts] section. You may want to write down the names of these fonts for future reference.

Better yet, use the Clipboard and a Notepad session to *copy* the complete font list into a new file. (Be sure you don't *cut* the entry from WIN.INI.) After saving the list as a TXT file, you may want to go out to the DOS prompt and put its entries into alphabetical order for maximum convenience.

Teaming up the TYPE and SORT commands does the trick:

```
TYPE FONT1.TXT | SORT > FONT2.TXT
```

FONT1.TXT is the name of the unsorted list; FONT2.TXT contains the sorted list. Print the file as a record of each font and its filename for future reference. Of course, if you have Microsoft Word or another Windows word processor, you may find it more convenient to use that program's Sort feature to alphabetize the list.

Removing Fonts

When you have a firm list of the fonts you want to deinstall from Windows, open Control Panel (it's in Program Manager's Main group) and pick the Fonts tool. The first box that appears lets you view individual fonts and select those you want to remove from your computer. (See **Photo 2**, above.)

If you've never toyed with fonts before, it may surprise you to see that, in most cases, the dialog box

FONTS IN WINDOWS 3.1

Name	Type
Arial	TrueType
Arial Bold	TrueType
Arial Bold Italic	TrueType
Arial Italic	TrueType
Courier New	TrueType
Courier New Bold	TrueType
Courier New Bold Italic	TrueType
Courier New Italic	TrueType
Courier	raster
Modern	vector
MS Sans Serif	raster
MS Serif	raster
Roman	vector
Script	vector
Small	raster
Symbol	raster
Symbol	TrueType
System	raster
Terminal	raster
Times New Roman	TrueType
Times New Roman Bold	TrueType
Times New Roman Bold Italic	TrueType
Times New Roman Italic	TrueType



Photo 3. Fonts tool's confirmation screen. Don't select the Delete File check box unless you really want to erase the files from your hard disk.

lists four files for each TrueType font. The first contains the plain, or Roman, style; the next three files contain the font's bold, italic, and bold-italic styles. Control Panel's Fonts feature lists every raster, vector, and TrueType file you've installed. In contrast, most applications lump all four styles under a single font name. In certain instances, however, you'll find fewer than four

files. Script fonts often don't have an italic style, and some display or poster fonts are available only in Roman style.

If you're cleaning up, you'll probably want to deinstall several fonts. You could pick them one at a time, and then click on Remove and answer yes when the Fonts tool asks whether you're sure. But that approach would be needlessly

tedious. Instead, hold down the Ctrl key and click once on each font you want to remove. After making all your selections, click on the Remove button.

The Fonts tool will display a second dialog box (see **Photo 3**, left), asking you to confirm your decision to remove fonts. A check box in the middle of the dialog lets you delete the font file from your hard disk automatically as you deinstall the font. Unless you're sure you have a backup copy of the file, or you're certain you'll never want to use the font again, leave the Delete Font File box unchecked. Windows is programmed to go through your list of fonts one at a time, asking for your confirmation before deleting each one. To deinstall all selected

FONT MANAGEMENT UNDER WIN95

Win95 does a much better job of handling fonts than earlier versions of Windows. First, it keeps font names and file-names in its Registry, instead of in WIN.INI, which means that you may store an unlimited number of fonts on your computer. Second, instead of creating a separate FOT definition file for each installed True Type font, Win95 combines all definitions into a hidden file called TTFCACHE. Thanks to these improvements, you can now *print* as many as 1000 fonts in a single document. (Under Windows 3.x, you can't even *install* 1000 fonts on a single machine.) Even better, installing a large font collection doesn't slow down your computer.

There's another important difference, as well: Win95's Fonts tool doesn't supply a separate application for installing and removing fonts. When you double-click on the Fonts icon in Control Panel, what you see is a special Explorer view of your \WINDOWS\FONTS folder. This window provides two menu options that don't appear in any other Explorer window: File/Install New Font and View/List Fonts by Similarity.

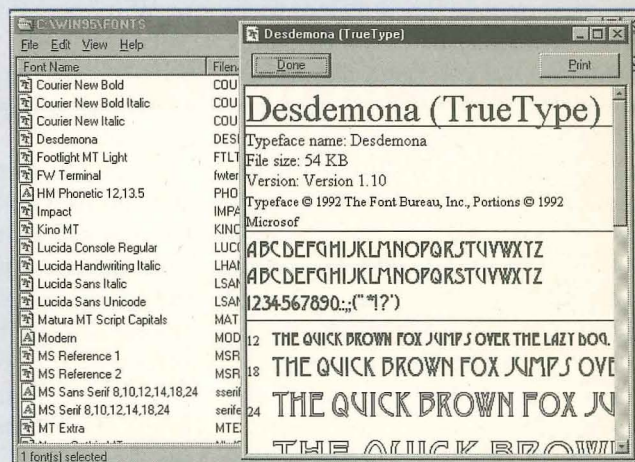
To see another nifty Fonts-window feature, double-click on any of the font files listed. Win95 pops open a window that names the font, displays information about it, shows each character in the font, and displays a sentence in several font sizes (see the accompanying screen shot, right). A click of a button sends the information in the display window to your printer.

To install new fonts in Win95, you have several choices. You can use the File/Install New Font dialog box, which lets you copy new fonts to your \WINDOWS\FONTS folder or leave them where they are on your hard disk and use them from that location. A more expedient way to install fonts is to simply copy the

new font files to the \WINDOWS\FONTS folder and restart Windows. In either case, Windows updates the Registry automatically and makes the new fonts available to all your apps.

I can think of only two reasons you'd need to deinstall a font under Win95: if you get an improved version of a font and want to remove the older versions or if your fonts are using disk space you need for other purposes. In either case, removing a font is simple: Delete it from \WINDOWS\FONTS as you would any other file. That's all there is to it. Windows will remove the font from the Registry the next time you boot up.

—H.B.



When you double-click on an entry in the Fonts window, Win95 pops open another window displaying information about that font.

fonts in one fell swoop, click on Yes to All instead of on Yes.

After installing the fonts you don't need, restart Windows. It should boot faster and make more memory and resources available to your applications. But you aren't quite finished yet.

Moving Files

When you use the Fonts tool to remove a font, Windows automatically erases the FOT information file. Unless you check the box in the middle of the confirmation dialog, Windows leaves the TTF file exactly where it was.

Now's the time to consider whether you want to carry your cleaning expedition one step further and trim your \WINDOWS\SYSTEM directory, by putting the unused TTF files in storage. Your printout of WIN.INI's [Fonts] section, along with your list of deinstalled fonts, will help you select the files to move.

To simplify the task, you can use the following DOS command to print an alphabetized list of the entries in your \WINDOWS\SYSTEM directory:

```
DIR C:\WINDOWS\SYSTEM /ON > PRN
```

You can then check for any TTF files for which you deinstalled the corresponding FOT file. Now you have a choice. You can move these unused TrueType fonts to another directory on your hard disk or store them on floppy disks or tape. Either way, if you don't plan to use any of the files for a while, you may want to use a compression program such as PKWare's PKZip to squeeze them and bundle them into a single file for easier storage. Or you could classify the unused fonts in some way, and put them into several zipped files for easier access in the future. It would then be simple to reinstall all the fonts in one of your groups.

Each file consumes between 40K and 80K of disk space. In zipped format, they'd likely be about half

the size. Only you can decide whether that kind of savings is worth the effort.

On my computer, I couldn't see a way to classify the deinstalled fonts, so I simply moved them to a new subdirectory. I can reinstall them when I need them. The advantage of keeping them in their default directory is simplicity and speed.

Windows often reads from that directory. If you move them, however, you'll have an easier time finding the other files in your \SYSTEM directory.

Before you do any moving, though, make sure you have a current backup of the contents of your \WINDOWS\SYSTEM and \WINDOWS directories. If your computer's fails during this part of the job, you may need them. Then start Control Panel's Fonts tool again and deinstall all TrueType fonts still installed. Don't deinstall the raster and vector fonts, and don't select the Delete File from Disk check box in the confirmation dialog. This step deletes all FOT files from your \SYSTEM directory.

Next, move all TTF files from your system directory to a new directory—perhaps one called TTF_FONT. You can use DOS's MOVE command or Windows' File Manager to simplify this task. Then all the TrueType fonts you want to install are nestled together in their own directory.

Start the Fonts tool again and click on Add on the opening screen. Use the drive and directory browser to find the subdirectory containing your fonts. Make sure the check box at the bottom of the screen, Copy Fonts to Windows Directory, doesn't contain a check mark. (See **Photo 4**, above.) After the Fonts tool reads font names from the directory, click on Select All and OK. Windows will reinstall

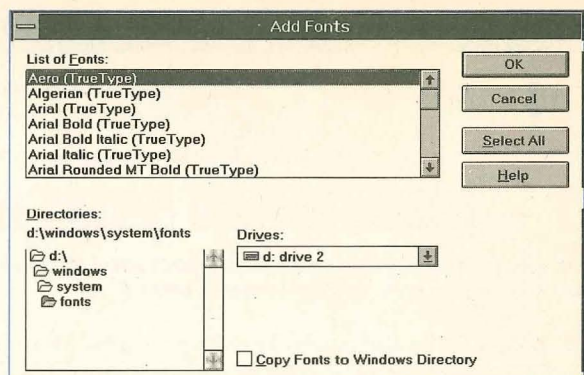


Photo 4. Add Fonts dialog box. Make sure to deselect the Copy Fonts check box, near the bottom, unless you really want to store the fonts in your \WINDOWS\SYSTEM directory.

all the fonts, but the TTF files won't be in your \SYSTEM directory.

Unfortunately, however, Windows will create a new FOT file for each font and place it in C:\WINDOWS\SYSTEM, just where you don't want it. But you can change that, also. First, use File Manager or the MOVE command to transfer those FOT files to the same directory as the TTF files. Next, use SysEdit, Notepad, or another text editor to change each line in WIN.INI's [Fonts] section so that it points to the correct directory.

If you use an editor with a macro command, it's a simple task to change \WINDOWS\SYSTEM to whatever directory you want with just a couple of key clicks on each line. Make sure not to change the lines that point to the FON files of raster and vector fonts, because you aren't moving those.

After editing WIN.INI, you're done. Save your files, close your editors, and restart Windows. When everything starts correctly, and your applications can use the fonts you left installed, you'll know you did everything right.

You may be surprised at how much faster Windows runs after you've finished. I removed 150 TrueType fonts from my system, recovered 15MB of hard-disk space, and made Windows more responsive. I haven't missed any of the fonts I discarded—at least not yet. But I've just discovered a new freeware font pack on the Internet . . . ■

For Your Information

For the most part, DOS programs work fine under Windows 3.x. But when trouble arises, it pays to know how to use a program-information file to set things straight.

by Lenny Bailes

For longtime DOS users, one of the chief attractions of Windows 3.x and Windows for Workgroups is their ability to run DOS programs in full-screen or windowed sessions. You can launch several DOS and Windows applications at the same time and switch from one to another in an instant. Luckily, most DOS applications run perfectly when you transport them to Windows, but occasionally you have to do some fiddling to get a finicky program to behave.

The key to convincing touchy DOS programs to settle down lies in tweaking their program information files (PIFs). These small files control the system settings for all DOS applications Windows opens. Within each PIF, you may specify the program's start-up directory, add command-line parameters to open a specific document, choose whether the program will occupy the entire screen or appear in a window, and decide whether it will keep running in the background or freeze when you switch

away. A program's PIF also controls the amounts of conventional, extended, and expanded memory Windows reserves for the program, the graphics modes the program can use, and whether you can start the program by pressing a special key combination.

In fact, Windows offers so many options for fine-tuning a PIF that it can set you to wondering whether you're doing the right thing by your DOS programs—even the ones that seem to be running okay. The answers to these frequently asked questions (FAQs) on PIFs will put an end to your uncertainty.



I've never created a PIF, yet my DOS applications still run fine under Windows. Why?

To reduce compatibility problems and make the upgrade from DOS to Windows as smooth as possible, Microsoft provided Win3.x and Windows for Workgroups with built-in PIFs. When you install Windows over an existing DOS con-

figuration, Windows Setup checks its database of information on DOS programs, C:\WINDOWS\APPS.INF, to see whether any of your programs are listed there.

When it finds a match among the approximately 200 non-Windows programs in the database, Windows places an icon for the program in the Applications group and uses the information in APPS.INF to create a suitable PIF.

If the Windows Setup module doesn't recognize a DOS program, it doesn't create a PIF. Instead, when you load that program, Windows uses the settings in its generic program-information file, C:\WINDOWS\DEFAULT.PIF.

In addition, some DOS programs—WordPerfect for DOS and Lotus 1-2-3 among them—come with their own PIFs, which the software's installation program places in each program's directory. Windows Setup doesn't recognize these vendor-supplied PIFs, but, as you'll see in a moment, you can add them to your Program Manager groups manually.

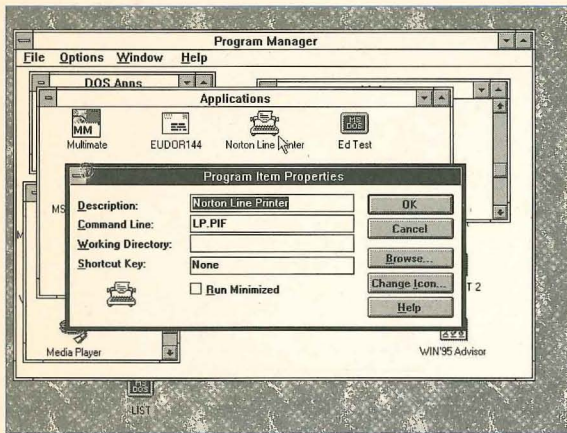


Photo 1. You can tell whether a program is using a customized PIF by opening its Program Item Properties dialog box.



How do I associate an existing PIF with a program icon?

You may not need to do that. During its installation, if Windows encounters a DOS application that's in its database, it adds it to the Applications program group and creates a PIF for the program. Double-clicking on the icon starts the PIF.

On the other hand, if you create an icon for a DOS program by dragging its executable file into a program group from File Manager, Windows doesn't create a program-information file. When you open this program, Windows uses the settings in `_DEFAULT.PIF`.

You can find out whether a program is using a customized PIF or Windows' generic PIF by clicking on the program's icon in Program Manager and then choosing File/Properties. When the Program Item Properties dialog box appears, look at its Command Line box. If it mentions an executable file, such as `C:\WP51\WP.EXE`, Windows isn't using a customized PIF. If it mentions a PIF, such as `WP.PIF`, the program is already using a customized PIF. (See **Photo 1**, above.)

If you know that a PIF exists for a certain program, but the Properties box indicates that Windows isn't using it, you can tell Windows to use it by typing the directory location (path) and name

of the PIF into the Command Line box. If the file resides in the Working Directory specified in the next Program Properties line, you don't need to supply a path.

If you think a PIF exists for one of your DOS programs, you can mount a search from the Program Item Properties box by clicking on the Browse button. Windows will open a Browse dialog box at the directory listed in the Working Directory box. (See **Photo 2**, below.) If you find an appropriately named PIF listed among the files in that directory, double-click on it. Windows will place the correct path and filename in the Program Item Properties' Command Line box.



How would I go about creating a program information file from scratch?

First, start PIF Editor by double-clicking on its icon, which usually resides in the Main group. (See **Photo 3**, opposite.) Then choose File/New to open a new file. Name it by choosing File/Save As, assigning a path, providing a base filename corresponding to the base filename of the executable file, and giving it the extension PIF. Then fill in the program's filename (be sure to include an extension, such as COM, EXE, or BAT), the window's title, and the name of the starting directory for the application. If you don't supply a title, Windows uses the name of the program's PIF in the title bar. If you don't type anything in the Startup Directory box,

the application starts from the directory containing the PIF. The default values for Memory Requirements, Display Usage, and so on are the values contained in Windows' generic PIF, `_DEFAULT.PIF`. After making necessary changes, save the PIF again.

If one of your DOS applications has a PIF that appears to work well, you may want to use that PIF as a template for creating a new one. To do that, open PIF Editor, choose File/Open, and type the path and filename of the PIF you want to use as a template. You'll find some PIFs in your `C:\WINDOWS` directory; others reside in the main directory for each DOS application.

After loading an existing PIF into PIF Editor, change the Program Filename, Window Title, Optional Parameters, and Startup Directory; then choose Save As and assign your new PIF a path and filename. (See **Photo 4**, opposite.)



How do I know if I need to edit an existing PIF?

The four most common symptoms of PIF problems are the following:

- **A disappearing act.** If an app's window appears momentarily and then vanishes, the program probably doesn't have enough conventional, expanded, or extended memory at its disposal.

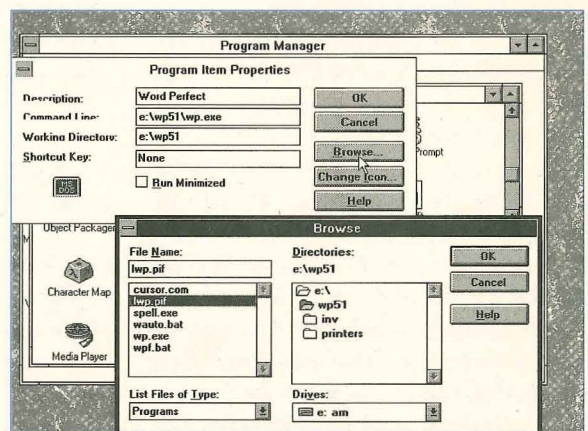


Photo 2. Use Program Item Properties' Browse option to try to locate an existing PIF.

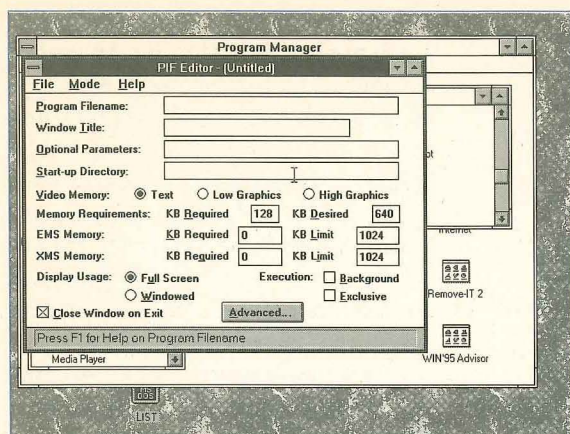


Photo 3. When you start PIF Editor, it shows the default video, memory, and display settings.

- **A freeze-up.** If the application appears on screen and then freezes, you may need to modify the settings for video memory.
- **A slow screen-refresh rate.** Your video-memory setting may also be due for a change if your system takes a long time redrawing windows and images on screen.
- **You can't run a DOS application, such as a word processor or a communications program, in the background.** In this case, you'll need to play with the settings that control background execution.

After you change a PIF's value, you must restart the application to put your new settings into effect. You don't have to restart Windows or reboot your computer.



PIF Editor includes a Mode menu that lets you choose Standard or Enhanced settings. I run my 486 system in Enhanced mode; will I ever need to create a Standard-mode PIF?

You probably won't need to create a Standard-mode PIF, unless you plan to start Windows 3.1 in Standard mode (by typing `WIN /S` at the DOS prompt or including this command in your `AUTOEXEC.BAT` file).

Enhanced modes. To modify a PIF by adding settings for the Windows mode not currently running, select the other mode from PIF Editor's pull-down Mode menu.



I understand the purpose of Enhanced mode's basic features, such as Program Filename, Window Title, and Start-Up Directory, but what do Optional Parameters and all those other features do?

The Optional Parameters box is included as a time-saver. It lets you load a program and one of its files by double-clicking on an icon.

For example, if you typically open a data file called `CUSTBASE.DB` whenever you start your DOS database manager, you can type the name of that data file into the Optional Parameters box.

Thereafter, whenever you start your database, Windows will give it the message to open `CUSTBASE.DB`, too. If the application associated with a PIF you're editing permits command-line switches, you may also place one or more switches in the Optional Parameters box. For example, you might

place a command such as this one in the box:

```
C:\WP\WP /R /F2
```

If you use a different data file each time you start your DOS-based database, spreadsheet, or word processor, you can put a question mark in this box. Windows will then prompt you for the name of the file you want to load. For instance, if you include a question mark on the Optional Parameters line for `EDIT.COM`, whenever you launch the editor Windows prompts you to provide the name of the text file you want to load. (See **Photo 5**, page 48.)

The Video Memory settings let you control the screen-display mode Windows reserves for the application. For most text-based programs, choose the Text button. For graphics applications running in 640 by 480 pixels with 16 colors or a lower resolution, choose the Low Graphics option.

The Memory Requirements options set both minimum and maximum amounts of conventional, expanded, and extended memory that Windows reserves for your application. If you're looking to maximize available memory, consider altering the default settings.

For example, `EDIT.COM` requires only 128K of conventional memory; it doesn't need extended (XMS) or expanded (EMS) memory.

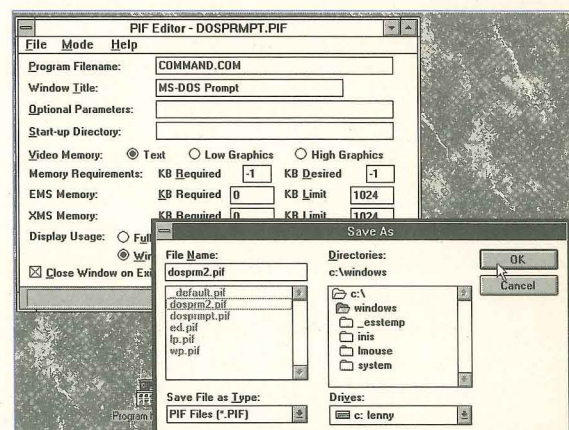


Photo 4. To create a new PIF, change PIF Editor's settings as necessary, and then choose File/Save As.

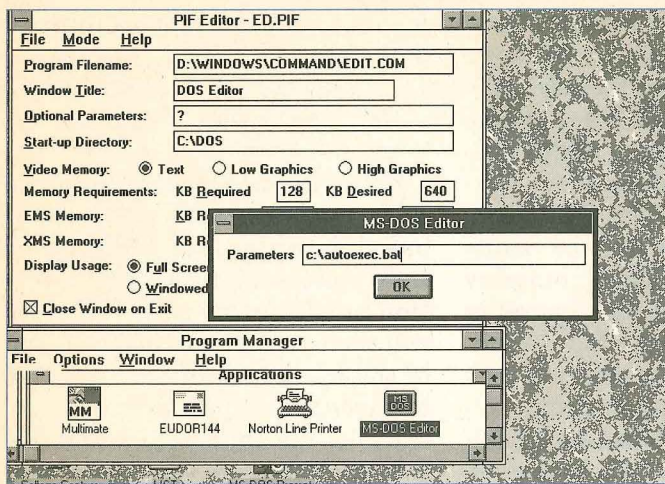


Photo 5. When you place a question mark in the Optional Parameters box, Windows prompts you to supply the name of the data file you want to load along with your program.

To conserve system resources, you might choose the following memory settings:

- **Conventional:** 128 for KB Required (the minimum) and 256 for KB Desired (the maximum)
- **EMS:** zero for both KB Required and KB Limit
- **XMS:** zero for both KB Required and KB Limit

WordPerfect 5.1 for DOS requires at least 384K of conventional memory to start and doesn't work efficiently unless it has more. This version of WordPerfect doesn't use XMS memory, but it can use EMS to speed up performance while processing large documents. You might choose the following as its memory settings:

- **Conventional:** 384 for KB Required and 640 for KB Desired
- **EMS:** 256 for KB Required and 1024 for KB Limit
- **XMS:** zero for both KB Required and KB Limit

With these settings, Windows will open WordPerfect with *as little as* 384K of conventional memory and 256K of EMS memory available. It will reserve 640K of conventional memory and 1024K of EMS memory for the program, if these resources are available.

To tell Windows to allocate an unlimited amount of memory in

any of the specified categories, place a -1 parameter in that option's KB Desired or KB Limit box.

The Display Usage settings determine whether your application is displayed in a window or occupies the entire screen. The Execution settings tell Windows whether to freeze your DOS application when you switch to another program. If you don't check Background or Exclusive, Windows freezes the DOS program when you switch to another application. If you check Background, the DOS program will continue to operate in the background. To give a DOS program exclusive control of the CPU, which suspends any DOS applications running in the foreground, choose Exclusive.

The Close Window on Exit box determines whether Windows closes the program's window automatically when you terminate the program. If this box is empty, the application window remains on screen after you've exited the program. That might be desirable if, for example, the program displays important messages on screen after it closes.



I'm not what you'd call an advanced user. Should I leave the Advanced options alone?

If a DOS application is misbehaving, it's likely that you, or perhaps

a more knowledgeable friend, will have to play with the the Advanced options. The selections in this box control the way DOS applications share processing time with other applications. They also let you set advanced memory and display options for ill-behaved DOS programs, permit your DOS program to use keystroke combinations normally reserved by Windows, and let you assign a special "hot key" combination to start your program. (See **Photo 6**, opposite.)

Multitasking Options controls how much CPU time a DOS application receives when running in the foreground or in the background. The Background Priority box lets you establish the relative amount of processor time accorded a program when it runs in the background. The value may range from zero to 10000; the default value is 50. The Foreground Priority box establishes the processing allotment given a DOS program running in the foreground. As with the background setting, the value may range from zero to 10000; the default value is 100. The accompanying sidebar, "Setting Priorities" (page 50), shows how these settings determine the amount of time given to three DOS program running concurrently.

The Detect Idle Time check box tells Windows to monitor an application while it's running and to reclaim CPU time when the program is waiting for user input or a system event. If a DOS program is sluggish, click to remove the check from the Detect Idle Time box. Windows is probably grabbing CPU time from the program.

The Advanced box's Memory Options entries let you fine-tune the performance of your DOS applications. Normally, the boxes for EMS Memory Locked, XMS Memory Locked, and Lock Application Memory should remain off. Turning them on steals memory from other programs, preventing Windows from swapping memory allocated to

the program out to the swap file on your hard disk. Although activating these options can improve a program's performance, it may slow down Windows' overall efficiency. Turn on the lock options one at a time if a DOS program crashes when you try to run it.

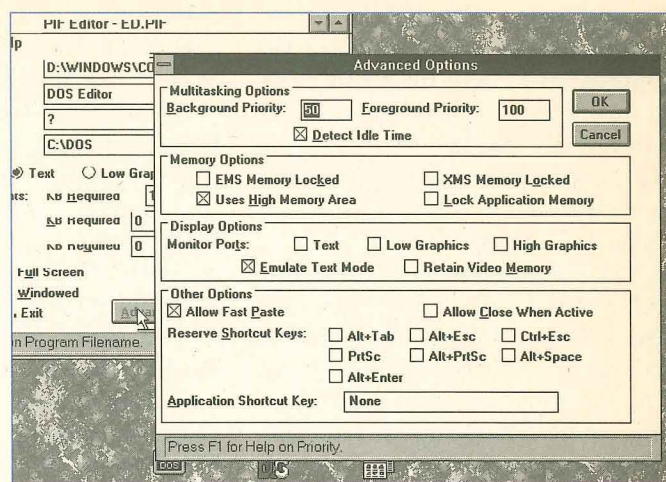
In most cases, you should leave the Uses High Memory Area option off. It lets you reserve a special 64K area of memory, the HMA, for use by DOS applications that can recognize it. Most DOS programs aren't written to take advantage of this area, however, and even if they are, they don't get the opportunity to use it, because DOS takes it over. (See the "Maximizing Memory" question in this issue's "Reader Forum," page 10, for details.)

Display Options tells Windows how to handle the screen for your applications in Text, Low Graphics, or High Graphics mode. If your application uses only text mode, leave the graphics monitor-port options unchecked, because activating them slows down performance needlessly. Activating Emulate Text Mode increases the speed with which some applications display and scroll text on screen. In general, this option should be turned on (the default), unless your program is skipping characters or having other problems displaying text.

The Retain Video Memory option prevents Windows from temporarily borrowing your program's video memory and transferring it to another program that needs it. Generally, you should leave this option off (the default) to ensure the highest performance possible. If you're running a DOS application that constantly switches from one video resolution to another, however, or you run out of memory when your program switches to graphics mode, check the Retain Video Memory option.

Activating Allow Fast Paste speeds up the rate at which text and graphics are pasted to the Clip-

Photo 6.
The Advanced Options dialog box lets you allot foreground and background processing time, control maximum and minimum memory allocation, and reserve shortcut keys.



board. Generally, you should leave this option on, unless the program loses text because the Clipboard sends it data too fast. Checking Allow Close When Active lets you end a DOS session from Windows' Task Manager while an application is still active. Turning this option on also lets you quit Windows while a DOS session is still open. If you're working with a program, such as a word processor, that lets you update files, it's best to leave this option off. That way, you're less likely to lose changes you've made to a file but haven't saved. Most DOS programs will remind you to save changes before they let you shut down.

Reserve Shortcut Keys lets an open DOS application use the indicated keystroke combinations, which ordinarily are reserved for Windows' internal use.

For instance, if you want Alt+spacebar to run a macro in your word processor, place a check mark in its box to make this combination available to the application. Otherwise, Windows uses this combination to open a window's pull-down Control menu.

Finally, use the Application Shortcut Key option to assign a key combination you can type to open a program. To specify a shortcut key, place the cursor inside this box and type the keystrokes you want to use. Shortcut keys must begin with the Alt or Ctrl key; they may

include either alphanumeric characters or function keys. For example, Ctrl+S and Alt+F1 are permissible shortcut-key assignments. To delete a shortcut key, place the cursor in the box and press the backspace key.



I've set up my word processor's PIF to use \LETTERS as the working directory, but my word processor still uses \WP as the working directory. What's going on?

Click once on the icon for your word processor in Program Manager and choose File/Properties (or press Alt+Enter). If there's a setting in the Working Directory box in the Program Item Properties box, it overrides the one in the program's PIF. To use the PIF value, clear this entry.

A similar conflict develops if you designate a shortcut key in both a program's Program Item Properties dialog box and its PIF; Windows uses the one in Program Item Properties.



I've read that you can create several different PIFs for the same program. Why would I want to do that?

You might want to create several different PIFs if you want to launch

the application with different start-up directories, or if you want the application to load different documents. You also might want one icon to load the program in a full-screen session and another to load it in a window.

You may create several different icons for your program and assign each one a different PIF. You may also launch alternate versions of a program by double-clicking on a different PIF for it in File Manager, or by specifying an alternate PIF in the File/Run box in Program Manager or File Manager.



Can I create several different DOS windows, too?

Yes. One reason is to provide a choice between a full-screen and a windowed DOS session. You might

also want to create DOS sessions that use different default font sizes or start in different directories.

The quickest way is to start PIF Editor and open C:\WINDOWS\DOSPRM2.PIF. Then alter the settings to create a second PIF and use File/Save As to save the PIF as DOSPRM2.PIF. Next, make a copy of the original MS-DOS Prompt icon in the Main program group by holding down the Ctrl key and dragging it to a different group. Then click on it once, and press Alt+Enter. Edit the Command Line box to start with C:\WINDOWS\DOSPRM2.PIF.



Is it a good idea to run a DOS program from a DOS box for which you haven't customized the PIF?

SETTING PRIORITIES

Confused by Windows' method of assigning processing time to DOS programs running in the foreground and background? These examples will clarify it.

Assume that three programs—Application A, Application B, and Application C—each has its Background Execution box checked and that their relative Foreground and Background values are as follows:

	Foreground Value	Background Value
Application A	100	0
Application B	100	50
Application C	100	50

The subtotal of foreground processor time is 100, because only one program can run in the foreground at a time. If Application A is running in the foreground, the subtotal of background processing time allotted for B and C is 100. The total of allotted foreground and background processor time is 200.

When Application A runs in the foreground, it receives 50 percent of the total processor time (foreground divided by total time = 100/200). Applications B and C, running in the background, each receive 25 percent (50/200) of the total available CPU time.

When Application B runs in the foreground, it receives 100 out of 150 possible CPU slices, or 67 percent of the processor's time. The total CPU time demanded is only 150 in this case: 100 in the foreground for B and 50 in the background for C. (Application A's background value is zero.) Application C, running in the background, receives 33 percent of the CPU's time, and Application A is suspended.

—L.B.

For many DOS programs, that works fine. If your particular DOS application has special memory or graphics requirements, however, you should probably create a separate PIF for it.



Can I create a PIF that starts a batch file? What's the special advantage of doing that?

You certainly can create a PIF to run a batch file. One obvious reason is to update a backup directory for an application before opening it to work on your data files. You might also want to use this technique to change the DOS path for your application or to set an environment variable.

To execute a batch file from a PIF, first construct the batch file in a text editor; then specify the name of the batch file in the Program Filename line in PIF Editor.

For example, suppose that each time you start Lotus 1-2-3 you want to back up your spreadsheet directory and change the Application Path setting to recognize a Lotus directory called \ADDINS. The following three-line batch file will let you do that:

```
MY123.BAT
PATH=C:\DOS;C:\WINDOWS;C:\123R3;
C:\123R3\ADDINS;C:\SHEETS
COPY C:\123R3\*.WK3 C:\SHEETS 123
```

Then open PIF Editor, load your existing PIF for 1-2-3 or create a new one, and type 123.BAT in the Program Filename line.

If you want the DOS command prompt to remain open after executing a batch file, include the following command as the last line of the batch file:

```
%COMSPEC%
```

That DOS command loads a permanent copy of COMMAND.COM and forces the window to remain open until you type EXIT. ■

Seeing the ERRORLEVEL Of Your Ways

When it comes to writing batch files, you should expect the unexpected. Using ERRORLEVEL to interpret exit codes will help you cope with every eventuality.

by Hardin Brothers

If you work at the DOS prompt, typing in one instruction at a time, you usually notice when programs run successfully and when they encounter errors. But typing lots of commands is boring and error-prone. Generally, it's more efficient to put commands you use time and again into a batch file; then you can execute them by typing a single command.

But how can the batch file watch the screen the way you do? If your batch file includes a `FORMAT` command, for example, how can it tell whether the format was successful? The secret lies in something called *exit codes*.

Whenever a utility program, an application, or `FORMAT` or another external DOS command ends, it returns a code number between zero and 255 to `COMMAND.COM`—the DOS program that displays the DOS prompt, waits for your input, and runs batch files. Programs can, and often do, use these exit

codes to tell a batch file whether or not they were successful. Some programs, however—especially large applications—ignore exit codes and either always send a code of zero or send a random number to DOS's `COMMAND.COM`.

Most programs that do employ exit codes use a code of zero to mean they've finished a task successfully. Any other code usually means that they've run into a problem. How can you tell whether a program uses exit codes and, if it does, what the codes mean? The only reliable way is to read its documentation. If you discover that the program uses exit codes, it's wise to then experiment to make sure the documentation is correct.

Using Exit Codes

Once you know about exit codes, and what codes your favorite external commands and utility programs return, the next problem is finding the code when a program exits. Unfortunately, without spe-

cial programming tools, you can't view an exit code, send it to the printer, or save it to a file. The only way you can get access to an exit code is within a batch file.

In batch files, exit codes are represented by the word `ERRORLEVEL`, which you must use in an `IF` statement. The statement's basic syntax looks like this:

```
IF ERRORLEVEL x ...
```

or:

```
IF NOT ERRORLEVEL x ...
```

where *x* represents any number from zero to 255. The ellipses (...) represent any valid batch-file command, including another `IF ERRORLEVEL` statement.

But normally, the ellipses are replaced with a `GOTO` statement that sends the batch file to a new line. When used this way, a program's exit code lets DOS branch to a new part of the batch file.

Listing 1. SAMPLE1.BAT shows how to use the **CHOICE** command in conjunction with **ERRORLEVEL**. Note that line numbers followed by a single colon are for reference only; don't type them in.

<pre> 1: @ECHO OFF 2: CLS 3: 4: :LOOP 5: CHOICE /C:ABC "Press A, B, or C now " 6: IF ERRORLEVEL 3 GOTO KEY_C 7: IF ERRORLEVEL 2 GOTO KEY_B 8: IF ERRORLEVEL 1 GOTO KEY_A 9: GOTO END 10: 11: :KEY_A 12: ECHO You pressed A that time 13: ECHO. 14: GOTO LOOP </pre>	<pre> 15: 16: :KEY_B 17: ECHO You pressed B that time 18: ECHO. 19: GOTO LOOP 20: 21: :KEY_C 22: ECHO You pressed C that time 23: ECHO. 24: GOTO LOOP 25: 26: :END </pre>
---	---

End

Be careful, though: Neither of these lines does quite what you might think. The statement **IF ERRORLEVEL 3** doesn't mean *if the exit code is 3*. Rather, it means *if the exit code is 3 or greater*. Another way to say it is *if the exit*

code is at least 3. Similarly, **IF NOT ERRORLEVEL 3** means *if the exit code is less than 3*.

The easiest way to get your batch file to test for one exit code—for example, a value of 3—is by using this command:

IF ERRORLEVEL 3 IF NOT ERRORLEVEL 4 ...

which translates to *if the errorlevel is at least 3 and if it isn't as large as 4 ...*

ERRORLEVEL in Action

The best way to learn to use exit codes and **ERRORLEVEL** is to pair it with the **CHOICE** command, introduced in DOS 6.0. **CHOICE** prompts you to press a key and then returns an exit code based on that key. If you pick the first possible key, **CHOICE** returns an exit code of 1. If you pick the second key, **CHOICE** returns a 2, and so on.

Listing 1, **SAMPLE1.BAT** (above), shows a simple batch program containing **CHOICE**. Normally, a batch program that uses **CHOICE** runs an application or takes another action based on the user's selections. But this sample program simply displays a message stating which key you pressed, and then displays the menu again. When you want to stop the batch file, press **Ctrl+C** or **Ctrl+Break** to end the program.

The first line of the program stops **COMMAND.COM** from displaying each line before executing it; almost all batch files start with this command. The second clears the screen, and the fourth defines the beginning of a program loop.

The interesting part of the batch file begins on the fifth line, the one that uses **CHOICE** to display the

DOS Tip

Speeding Up Your Keyboard

You probably know that if you hold down a key long enough, the character eventually starts to repeat. IBM calls this the keyboard's *typematic action*. The typematic effect is made up of two components: the repeat rate and the initial delay. By default, DOS sets the keyboard typematic constants to somewhere between annoying and unbearable. But you can use the following syntax for the **MODE** command to remedy this situation:

MODE CON RATE=r DELAY=d

The delay argument, *d*, indicates how long you must press and hold a key before DOS starts to repeat the character. Valid values are 1, 2, 3, and 4, which represent .25, .50, .75, and 1 second, respectively. The default value is 2.

The rate argument, *r*, indicates the number of repeat characters generated per second. Valid values range from 1 through 32 and represent (approximately) rates of 2 through 30 characters per second. The default value is 20.

Power users, touch typists, and people with espresso machines should kick their keyboards into turbo mode with this command:

MODE CON RATE=1 DELAY=1

On the other hand, kids and folks who like to linger over their keypresses should try the following command, engaging what's affectionately known as "Valium mode":

MODE CON RATE=4 DELAY=30

—Robert L. Hummel

message "Press A, B, or C now" and waits for you to press one of those keys. The option /C:ABC tells CHOICE that it should accept only one of those keys.

If you press A, CHOICE returns an exit code of 1. Pressing B returns a code of 2, and C returns a code of 3. Those codes are a result of the order of acceptable keys in option /C:ABC. The next three lines test for each of those exit codes.

Line 6 tests for an ERRORLEVEL value of 3. Because IF ERRORLEVEL 3 means *if the exit code is 3 or more*, this line must be first. You know the exit code can't be greater than 3 because the user has only three acceptable keys—the ones mentioned in the CHOICE command. So, in effect, this line says:

```
If the exit code was 3
(it can't be greater),
go to the label KEY_C.
```

The test for 2 comes next, in line 7. The value of ERRORLEVEL can't be greater than 2 (because the previous line tested for that), so the program will branch to KEY_B only if the user pressed the B key. Similarly, the program will branch to KEY_A in line 8 only if the user pressed the A key.

Line 9 is necessary, because if you press Ctrl+C or Ctrl+Break when CHOICE is running, it returns an exit code of zero. COMMAND.COM will ask whether it should terminate the batch file when it detects Ctrl+C. If you omit line 9 and say no in response to this prompt, line 12 would indicate that you'd pressed A, the batch file would return to :LOOP, and the batch file would run again. So line 9 provides a way to always end the batch file when the user presses Ctrl+C or Ctrl+Break.

Experiment with SAMPLE1.BAT. Try adding more selections or other key options in line 5 by changing the sequence /C:ABC within the CHOICE command and then rewriting the rest of the batch file appro-

priately. When you can put as many options as you want into line 5 and display an appropriate message for each, you'll be ready to tackle the next step: handling the exit codes that other programs send your way.

Testing ERRORLEVEL

When you're writing and testing batch files, it's often handy to display the exit code a program returns. But that's difficult to do because ERRORLEVEL can appear only after IF or IF NOT. If you try a

command like this to display a program exit code:

```
ECHO ERRORLEVEL
```

the batch file will simply display this message on screen:

```
ERRORLEVEL
```

Does that mean you can't display exit codes at all? Of course not; it's just a little difficult. **Listing 2**, TESTCODE.BAT (below), is a batch-file fragment that displays an exit

Listing 2. TESTCODE.BAT displays the exit code returned by any program. Before you can use the program, you must insert a command in line 4. Line numbers followed by a single colon are for reference only; don't type them in.

```
1: @ECHO OFF
2: :: Save this as TESTCODE.BAT
3: :: Place the command you want to test here:
4:
5: :: After the command runs, this batch file will display whatever
6: :: exit code it returned.
7:
8: @ECHO OFF
9: FOR %%x IN (0 1 2) DO IF ERRORLEVEL %%x00 SET ERROR=%%x
10: IF %ERROR%==2 GOTO ABOVE_200
11:
12: FOR %%x IN (0 1 2 3 4 5 6 7 8 9) DO IF ERRORLEVEL %ERROR%%x0
    SET ERROR1=%ERROR%%x
13: SET ERROR=%ERROR1%
14:
15: FOR %%x IN (0 1 2 3 4 5 6 7 8 9) DO IF ERRORLEVEL %ERROR%%x
    SET ERROR1=%ERROR%%x
16: SET ERROR=%ERROR1%
17: GOTO END
18:
19: :ABOVE_200
20: FOR %%x in (0 1 2 3 4 5) DO IF ERRORLEVEL %ERROR%%x0 SET
    ERROR1=%ERROR%%x
21: SET ERROR=%ERROR1%
22: IF %ERROR%==25 GOTO ABOVE_250
23:
24: FOR %%x IN (0 1 2 3 4 5 6 7 8 9) DO IF ERRORLEVEL %ERROR%%x
    SET ERROR1=%ERROR%%x
25: SET ERROR=%ERROR1%
26: GOTO END
27:
28: :ABOVE_250
29: FOR %%x in (0 1 2 3 4 5) DO IF ERRORLEVEL %ERROR%%x SET
    ERROR1=%ERROR%%x
30: SET ERROR=%ERROR1%
31:
32: :END
33: SET ERROR1=
34: ECHO Errorlevel is %ERROR%
35: SET ERROR=
```

End

EXIT CODES FOR DOS's EXTERNAL COMMANDS

In DOS 6.x, 16 external commands—such as FORMAT, whose programs DOS must load into memory each time you use them—return reliable exit codes you can use in your batch files. The following are the documented codes for these external commands. Consult your DOS manual and DOS's on-line help for more information.

● CHKDSK

- 0 CHKDSK didn't find any errors.
- 255 CHKDSK found one or more errors.

● CHOICE

- 0 The user pressed Ctrl+C or Ctrl+Break.
- 1 The user pressed the first key assigned.
- 2 The user pressed the second key assigned.
- 3 The user pressed the third key assigned.
- 255 CHOICE detected an error, such as an incorrect option on the command line.

● DEFRAG

- 0 The defragmentation was successful.
- 1 Internal error.
- 2 The disk contained no free clusters.
To operate, DEFRAG needs one free cluster.
- 3 The user pressed Ctrl+C to stop the process.
- 4 General error.
- 5 DEFRAG encountered an error while reading a cluster.
- 6 DEFRAG encountered an error while writing a cluster.
- 7 Allocation error. To correct it, use the SCANDISK command.
- 8 Memory error.
- 9 Insufficient memory to defragment the disk.

● DELTREE

- 0 DELTREE deleted a directory successfully.
Any other ERRORLEVEL indicates that an error occurred.

● DISKCOMP

- 0 The disks are the same.
- 1 Differences were found.
- 2 The user pressed Ctrl+C to stop the process.
- 3 Critical error. (For example, one of the disks is damaged.)
- 4 Initialization error.

● DISKCOPY

- 0 The copy operation was successful.
- 1 Nonfatal read/write error.
- 2 The user pressed Ctrl+C to stop the process.
- 3 Critical error.
- 4 Initialization error.

● FIND

- 0 The search ended successfully and at least one match was found.
- 1 The search ended successfully, but no matches were found.
- 2 The search didn't end successfully. In this case, an error occurred during the search, and FIND can't report whether any matches were found.

● FORMAT

- 0 The format operation was successful.
- 3 The user pressed Ctrl+C or Ctrl+Break to stop the process.
- 4 A fatal error occurred (any error other than zero, 3, or 5).
- 5 The user pressed N in response to the prompt "Proceed with Format (Y/N)?," which stops the process.

● KEYB

- 0 The keyboard-definition file was loaded successfully.
- 1 Invalid keyboard code, character set, or syntax.
- 2 The keyboard-definition file is bad or missing.
- 4 An error occurred while communicating with the keyboard or monitor.
- 5 The requested character set hasn't been prepared.

code from any program. Simply put the command you want to test near the beginning of the batch file and

run it. When the test command finishes, its exit code will appear on your screen.



Preview Primer

Although WordPerfect 6.0 for DOS doesn't offer WYSIWYG (what you see is what you get), you can still get an idea of what your document will look like when printed. Just choose File, then Print Preview—or press Shift+F7,7.

If you're new to batch-file programming, TESTCODE.BAT may look complicated. If you don't understand all the FOR...IN...DO lines and all the percent signs, don't worry. Just type the listing as shown, check for typos, save it to disk, and use it when you want to find out what exit code a program is returning. You don't have to understand how TESTCODE.BAT works to use it to write better batch files.

● MOVE

- 0 The MOVE command successfully moved the file(s) you specified.
- 1 An error occurred in moving one or more of the files you specified.

● MSAV

- 0 No virus detected.
- 86 A virus was detected.

Note: MSAV produces these error codes only if you use the command's /N option.

● REPLACE

- 0 REPLACE replaced or added the files successfully.
- 1 The computer's version of MS-DOS is incompatible with REPLACE.
- 2 REPLACE couldn't find the source files.
- 3 REPLACE couldn't find the source or destination path.
- 5 The user doesn't have access to the files you want to replace.
- 8 Insufficient system memory to carry out the command.
- 11 Incorrect syntax on the command line.

● RESTORE

- 0 RESTORE restored the file(s) successfully.
- 1 RESTORE couldn't find the files to restore.
- 3 The user pressed Ctrl+C to stop the restoration operation.
- 4 RESTORE stopped because of an error.

● SCANDISK

- 0 ScanDisk didn't detect any problems on the drive(s) it checked.
- 1 ScanDisk couldn't run because the command-line syntax was incorrect.
- 2 ScanDisk terminated unexpectedly because of an out-of-memory error or an internal error.
- 3 The user chose to exit before ScanDisk had finished.

- 4 ScanDisk completed all logical checks on all drives, but the user exited from one or more surface scans before the scans were complete. Errorlevel 4 isn't returned if the user chose to bypass the surface scans completely.
- 254 ScanDisk found disk problems and corrected them all.
- 255 ScanDisk found disk problems, but it didn't fix all problems.

● SETVER

- 0 SETVER successfully completed its task.
- 1 Invalid command switch.
- 2 Invalid filename.
- 3 Insufficient system memory to carry out the command.
- 4 Invalid version-number format.
- 5 SETVER couldn't find the specified entry in the version table.
- 6 SETVER couldn't find the file SETVER.EXE.
- 7 Invalid drive.
- 8 Too many command-line parameters.
- 9 SETVER detected missing command-line parameters.
- 10 SETVER detected an error while reading SETVER.EXE.
- 11 The file SETVER.EXE is corrupt.
- 12 The specified SETVER.EXE file doesn't support a version table.
- 13 Insufficient space in the version table for a new entry.
- 14 SETVER detected an error while writing to the file SETVER.EXE.

● XCOPY

- 0 Files were copied without error.
- 1 No files were found to copy.
- 2 The user pressed Ctrl+C to terminate XCOPY.
- 4 Initialization error. Not enough memory or disk space, or you entered an invalid drive name or invalid syntax on the command line.
- 5 Disk-write error.

—H.B.

DOS Translation

If you use external DOS commands in your batch files, you can find out what codes they return by studying the accompanying sidebar, "Exit Codes for DOS's External Commands" (opposite page and above).

Except for the convention of zero indicating that an operation was successful, you'll see that the codes Microsoft picked for most of the

commands appear random. That's partly a historical accident. Most commands have kept the same exit codes from one version of DOS to another so that older batch files that use them won't be confused. But that means you have to review the sidebar or Microsoft's documentation each time you use one of those commands.

Almost every good batch file uses exit codes and ERRORLEVEL state-

ments to make sure that it either accomplishes its designated task or tells the user what went wrong. Once you learn how they work, they'll also help you write better batch files.

In addition, when you use exit codes and ERRORLEVELS properly, you can be confident that your batch file will work every time as you intended and won't run amok when an error does occur. ■

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EXCEPT for These, SELECT Those

Wildcards are great time savers, but when it comes to hard-disk housecleaning, a clean sweep may be more than you're looking for. Instead, pick your spots—DOS's batch language lets you design two short programs that will help you focus on the files you want to organize.

by Hardin Brothers

We sometimes forget how handy DOS's wildcards are. Instead of typing:

```
COPY *.TXT A:
```

just imagine having to type a COPY command for every TXT file in the current directory. You'd soon grow to hate the DOS interface, or you'd end up typing your fingers down to the first knuckle.

But what do you do when wildcards just can't help you select the files on which you want to act? For example, suppose the current directory contains 20 TXT files and you want to copy just ten of them to drive A. Or what if you want to delete all files in the current directory except the TXT files? Suddenly, DOS's wildcards don't seem to help much at all.

That's the dilemma I faced when I decided it was time to do some housecleaning on my hard drive. I needed to weed it out, back it up, and generally rearrange my direc-

tories and files before my hard drive became as disorganized as my office. Of course, I could have fired up DOS Shell, or used Windows' File Manager or Explorer, or even run a shell program such as Norton Commander or XTree Gold. But even they don't have all the flexibility I wanted.

Instead, I wrote a pair of batch files, SELECT and EXCEPT, that increase the power of most DOS commands. Now, if I want to copy everything except TXT files to drive A, I just type:

```
EXCEPT *.TXT COPY *.* A:
```

And, if I want to copy just some files, I type:

```
SELECT COPY *.TXT A:
```

Seems pretty intuitive, doesn't it? And it certainly beats typing an endless string of COPY commands. Besides, writing and debugging these batch files gave me a good

excuse to put off spring cleaning for another day or two.

(By the way, both of these commands are built into JP Software's 4DOS. But not everyone is wise enough to use 4DOS.)

SELECT First

We'll start with SELECT.BAT, which is the easier of the two programs to write and understand. (See **Listing 1**, page 58. Line numbers and the first colon following each one are for reference only; don't type them in.)

The program starts, as all batch files should, with a short comment explaining what it does. Then it goes through some simple tests to see whether the user needs help. Using SELECT, you can view the help screen in a number of ways. You can type any of the following:

```
SELECT /?
SELECT /h
SELECT /H
SELECT
```


In all of these cases, the batch file realizes that you really do need help, so it displays the explanatory text that appears near the end of the listing.

The required syntax for SELECT is as follows:

```
SELECT command files ...
```

That is, you type the word SELECT (in upper-, lower-, or mixed case), then the command you want to execute (such as COPY or DEL), then the files you want to work with (such as *.TXT), and finally any other information the command needs (such as the drive letter A:).

SELECT won't work properly if you insert option switches before the list of files, but it will accept options at the end of the command. If you don't specify any files, SELECT lets you know that you goofed and

displays an error message plus the help screen.

Once it starts, SELECT prompts you for each file in the group. For example, it might display lines such as the following:

```
COPY TEST1.TXT A: [Y,N]
COPY TEST2.TXT A: [Y,N]
```

If you press Y, DOS copies the file; if you press N, it doesn't.

COPY isn't the only command with which SELECT works. You can use it with any command, batch file, or utility program that accepts a filename as the first parameter on the command line.

Understanding the Code

SELECT gets down to business in line 23. It first creates a new batch file, called TEMP.BAT, in your C:\BAT directory. You can change the direc-

tory if you prefer. Assuming that you start SELECT with the following command:

```
SELECT COPY *.TXT A:
```

the new batch file will have three lines:

```
@ECHO OFF
CHOICE COPY %1 A:
IF NOT ERRORLEVEL 2 COPY %1 A:
```

The first line keeps the screen from looking messy; the second line uses the DOS CHOICE command to ask whether you want to operate on one particular file. If you answer Y, the third line then performs the operation.

Of course, SELECT doesn't know ahead of time that you want to copy files to drive A; that's why lines 24 and 25 include so many

Listing 1. SELECT.BAT lets you select the files you want to copy, delete, or perform some other action on. Note that line numbers and the first colon following each one are for reference only; don't type them in.

```

1: @ECHO OFF
2: :: SELECT.BAT
3: ::
4: :: This batch file implements a SELECT command
5: ::
6: :: See the text for cautions and an explanation
7: :: of how SELECT works
8: :: See the HELP section below for syntax
9:
10: :: Does the user want help?
11: IF !%1==!/? GOTO HELP
12: IF !%1==!/H GOTO HELP
13: IF !%1==!/h GOTO HELP
14:
15: :: Make sure that %1 and %2 exist
16: IF !%1==! GOTO HELP
17: IF !%2==! GOTO HELP
18:
19: :: Anything to SELECT?
20: IF NOT EXIST %2 GOTO NoFiles
21:
22: :: Save command to operate later
23: ECHO @ECHO OFF > C:\BAT\TEMP.BAT
24: ECHO CHOICE %1 %1 %3 %4 %5 %6 %7 %8 %9 >>
    C:\BAT\TEMP.BAT
25: ECHO IF NOT ERRORLEVEL 2 %1 %1 %3 %4 %5 %6
    %7 %8 %9 >> C:\BAT\TEMP.BAT
26:
27: :: Now call
28: FOR %%F IN (%2) DO CALL C:\BAT\TEMP.BAT %%F
29:
30: :: Clean up
31: DEL C:\BAT\TEMP.BAT
32: GOTO END
33:
34: :NoFiles
35: ECHO.
36: ECHO %0 failed to find any files to include
37: ECHO in your command, %1 %2 %3 ...
38: ECHO.
39:
40: :HELP
41: ECHO.
42: ECHO %0 lets you perform a command on
    all of the files
43: ECHO in the current directory you SELECT
44: ECHO.
45: ECHO Syntax:
46: ECHO %0 command files ...
47: ECHO.
48: ECHO For example,
49: ECHO %0 COPY *.TXT A:
50: ECHO.
51: ECHO will present a list of .TXT files in
    the current directory
52: ECHO and let you decide which you want to
    copy to drive A
53: ECHO.
54: :End

```

End

replaceable parameters. TEMP.BAT will contain whatever commands you entered originally; the only difference is that it will execute your command on only one file at a time.

Once SELECT has created TEMP.BAT, it does its real work in line 28. Using a FOR...IN...DO command, SELECT finds every file in the current directory that matches the wildcards you used in the original command line. It sends each file to TEMP.BAT, which displays a prompt and takes action if you tell it to.

Finally, SELECT cleans up by deleting TEMP.BAT and then jumps over the help screens. If you've gotten this far, you're a SELECT expert and obviously don't need assistance.

File Cleanup with EXCEPT

I find SELECT useful, but I use EXCEPT more often. For example, when I test shareware, I often want to delete all files in a directory except for the original ZIP files. I could type this line:

```
SELECT DEL *.*
```

and press Y for each file I want to delete. But I'd much rather type this:

```
EXCEPT *.ZIP DEL *.*
```

That line says that I want to delete every file in the current directory except those with the extension ZIP.

Like SELECT, EXCEPT begins by trying to determine whether you need assistance. You can ask for help explicitly by using a /?, /h, or /H option, or you can simply type this command:

```
EXCEPT
```

When EXCEPT thinks you need an assist, it displays its help screen and then ends.

SELECT used four lines to do its real work; EXCEPT is about three times as complex because it needs

12 lines to make everything work. (See Listing 2, page 60.)

How does EXCEPT work? It begins by turning on the H attribute (hidden) of every file you want to exclude from the operation. Then it performs the operation on the remaining files. Finally, it turns off the H attribute to "unhide" its original group of files.

That means that EXCEPT may fail to work properly if the command you choose can work with hidden files. For example:

```
EXCEPT *.TXT ATTRIB -A *.*
```

will fail and turn off the archive attribute on every file in the current directory, because ATTRIB works with all files, hidden or not.

A second danger lurks when you use the EXCEPT program: If, for some reason, the command fails or EXCEPT is interrupted, some files may remain hidden. If that happens, you can use the ATTRIB command manually to make those files visible again.

The First Step

EXCEPT begins, in line 23, by using the DIR /B command to create a list of files it needs to hide. It stores that list in a file called DIRLIST.TMP, again in the C:\BAT directory. (You can put the file into any other directory you want, but you probably shouldn't put it into the current directory. If you do, you might end up deleting it or moving it with an EXCEPT ... DEL or EXCEPT ... MOVE command.)

That part is easy, but now comes the real trick. EXCEPT has to run the command ATTRIB +H on every file in that list. It would be nice if there were a simple way to do that, but I don't know of one. Until someone shows me a faster way, I've used lines 24 to 33 to do just that.

The first step is to add a blank line to the end of the list of files. A simple redirected ECHO. command does the job. Next, the program sends the entire file to DATE as a set

of input. (The TIME command gives you the same results.)

To understand what happens next, type this command:

```
DATE
```

at the command line. Instead of a valid date, just type some words. Do that each time DATE presents a new prompt.

When you get tired, all you have to do is enter an empty line (such as the blank line you added to the end of the list of files).

The program sends DATE's output to the FIND command, which sends on only those lines containing the word *Enter*. Actually, line 25 uses the FIND command twice because, I've found, extraneous blank lines are sometimes added to the file when DATE's output is piped to FIND. Using FIND twice gets rid of those extra lines.

The program then saves the final output—a list of lines beginning with the word *Enter* and ending with a filename—in a file called TEMP.CMD. Line 26 adds the word EXIT on a separate line at the end of that file.

Okay, so line 25 takes a list of filenames and spits them back out with a bunch of words added before each name. What's the advantage of that? If you look carefully at TEMP.CMD, you'll see that each line begins with the word *Enter*. Now all you need is a batch file called ENTER.BAT to extract each filename and then use the ATTRIB command to hide it.

That's exactly what line 32 does; it creates a one-line batch file called ENTER.BAT. That one line, minus some error checking, looks like this:

```
ATTRIB +H %4
```

Now you have only one task left: We have to execute each line in TEMP.CMD. "I know," I hear some people saying. "Call it TEMP.BAT and simply CALL it."

Listing 2. EXCEPT.BAT performs an action on all files except the ones you exclude at the command line. Note that line numbers and the first colon following each one are for reference only; don't type them in.

```

1: @ECHO OFF
2: :: EXCEPT.BAT
3: ::
4: :: This batch file implements an EXCEPT command
5: ::
6: :: See the text for cautions and an explanation
7: :: of how EXCEPT works
8: :: See the HELP section below for syntax
9:
10: :: Does the user want help?
11: IF !%1==!/ ? GOTO HELP
12: IF !%1==!/H GOTO HELP
13: IF !%1==!/h GOTO HELP
14:
15: :: Make sure that %1 and %2 exist
16: IF !%1==! GOTO HELP
17: IF !%2==! GOTO HELP
18:
19: :: Anything to EXCEPT?
20: IF NOT EXIST %1 GOTO NoFiles
21:
22: ::Get to work
23: DIR /B %1 > C:\BAT\DIRLIST.TMP
24: ECHO. >> C:\BAT\DIRLIST.TMP
25: DATE < C:\BAT\DIRLIST.TMP | FIND "Enter" |
    FIND "Enter" > C:\BAT\TEMP.CMD
26: ECHO EXIT >> C:\BAT\TEMP.CMD
27:
28: :: TEMP.BAT now has list of files to exclude.
    Each filename
29: :: is the fifth entry in a line that begins
    with "Enter"
30:
31: :: Hide the selected files
32: ECHO @IF NOT !%4==! ATTRIB +H %4 >
    C:\BAT\ENTER.BAT
33: Command < C:\BAT\TEMP.CMD > NUL
34:
35: :: Now execute the command:
36: SHIFT
37: SHIFT
38: ECHO @%0 %1 %2 %3 %4 %5 %6 %7 %8 %9 >
    C:\BAT\TEMP.BAT
39: CALL TEMP.BAT
40:
41: :: Restore the original files
42: ECHO @IF NOT !%4==! ATTRIB -H %4 >
    C:\BAT\ENTER.BAT
43: COMMAND < C:\BAT\TEMP.CMD > NUL
44:
45: :: Now clean up
46: DEL C:\BAT\ENTER.BAT > NUL
47: DEL C:\BAT\TEMP.CMD > NUL
48: DEL C:\BAT\TEMP.BAT > NUL
49: DEL C:\BAT\DIRLIST.TMP > NUL
50: GOTO END
51:
52: :NoFiles
53: ECHO.
54: ECHO %0 failed to find any files to exclude
55: ECHO from your command, %2 %3 ...
56: ECHO.
57:
58: :HELP
59: ECHO.
60: ECHO %0 lets you perform a command on all files
61: ECHO in the current directory EXCEPT for
62: ECHO those you specify.
63: ECHO.
64: ECHO Syntax:
65: ECHO %0 files command ...
66: ECHO.
67: ECHO For example,
68: ECHO %0 *.TXT COPY *.* A:
69: ECHO.
70: ECHO will copy everything in the current
    directory to
71: ECHO drive A EXCEPT for files with a .TXT
    extension
72: ECHO.
73: :End

```

End

Yep, that's what I tried at first, but it doesn't work. Why? Because EXCEPT calls TEMP.BAT. Then TEMP.BAT runs (not calls) ENTER.BAT. When ENTER.BAT ends the first time, control returns to EXCEPT; that's the way CALL works. So only one file is hidden.

The solution is to type every line of TEMP.CMD at the command prompt. And the way to do that is to start a new copy of COMMAND.COM and send it TEMP.CMD as its input. It will run ENTER.BAT for each file in TEMP.CMD. When it's

done, it will execute the last EXIT line we put into TEMP.CMD, which means that it will return to the running batch file. And to keep the screen neat while all this is happening, you send COMMAND.COM's output to NUL, the bit bucket. This important line, then, looks like the following:

```
COMMAND < TEMP.CMD > NUL
```

Finishing Up

That was the hard part; everything else is easy. Lines 36, 37, and 38

write the original command—the one you want to operate on most files in the directory—to a new batch file called TEMP.BAT. Why? Because the command may start a batch file and, if it does, we want control to return to EXCEPT, not to the DOS prompt, when that batch file is done. Line 39 calls TEMP.BAT.

Finally, line 42 rewrites ENTER.BAT to turn off the H attribute on each file that was hidden. Then you use the same trick with COMMAND.COM to execute TEMP.CMD again to unhide the hidden files.

Finally, EXCEPT has to clean up by erasing all temporary files it has created.

Now, if you've been paying careful attention, you may think this batch file has been much ado about nothing. After all, you could have hidden the original set of files in just one line instead of six, couldn't you? That line would've looked something like this:

```
FOR %%F IN (%) DO ATTRIB +H %%F
```

Yep, that would've worked just fine. But then here's another problem: How do you unhide those files when you're done? Well, what's wrong with this:

```
FOR %%F IN (%) DO ATTRIB -H %%F
```

Nothing—except that it won't work. The FOR...IN...DO command doesn't find hidden files when it runs. That line won't unhide anything.

Okay, you could just try unhiding everything with this:

```
ATTRIB -H *.*
```

Yes, that would work. But that line unhides everything, both the files that EXCEPT hides temporarily and other hidden files in the same directory. But some of those files need to stay hidden; certain programs won't run if you unhide their special files.

Some of you may have thought of an even easier way—hiding the files with this line:

```
ATTRIB +H %1
```

and unhiding them with this one:

```
ATTRIB -H %1
```

That will indeed work. In fact, that's exactly the way I originally wrote EXCEPT. But again, it unhid

previously hidden files. I also ran into another problem. I tried to combine EXCEPT and SELECT like this:

```
EXCEPT *.EXE SELECT ...
```

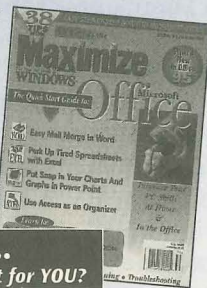
But I was using SELECT to start a batch file that required several parameters. One important one was cut off because *.EXE and SELECT each required one parameter slot. So I rewrote EXCEPT to let me pass as many as nine command-line parameters to TEMP.BAT. And that solved my problem.

You may not need EXCEPT and SELECT every day, but if your computing habits are similar to mine, you'll find them more and more useful. These aren't difficult batch files to write or understand, but after you've used them for a while, you may find that they've become an important part of your computing life. ■

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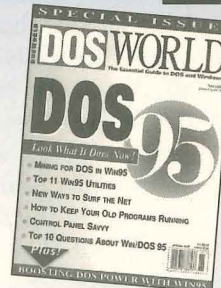
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Shift Away Your Burden

*dO YOU EVER FORGET TO RESET cAPS LOCK?
Here are a couple of utilities that will help.*

by Robert L. Hummel

Are you absent-minded? Do you forget to turn off the light when you leave a room? Ever leave your door unlocked when you go out for the day? How far have you driven before realizing that the parking brake is on?

The folks who write our computer software seem to understand that we're just as prone to such fumbles when we work with our PCs. Any word processor worth its salt contains an "undo" feature, for example. And few commands were as eagerly anticipated and desperately needed as UNDELETE.

But one glaring hazard remains: one that often catches me by surprise. I'll be typing at a furious pace, stop, glance up at the screen, and see an entire page of text that looks something like this:

HAS THIS HAPPENED to YOU?

Caught by the Caps Lock gremlin again!

Beware of Uppercase

Way back in the days of real typewriters, the Caps Lock function

was handy for typing long stretches of uppercase characters. And if you pressed the Shift key while Caps Lock was on, the typewriter would generate a loud CLUNK! and drop out of Caps Lock mode before you could type another character. It was an unmistakable sound that prevented many mistakes.

On the PC, however, Shift works quite differently. Caps Lock doesn't affect numeric or punctuation keys. Press the 4 key on the top row of your keyboard with Caps Lock on, for example, and you'll get the character 4, not the dollar symbol (\$).

For the alphabetic keys, however, Caps Lock works in a strange sort of cooperation with the Shift key—and therein lies the rub. Pressing the Shift key reverses the current Caps Lock state temporarily. If Caps Lock is off, pressing Shift+A produces an uppercase A, but if Caps Lock is on, pressing Shift+A produces a lowercase a. Leave Caps Lock on accidentally, and you'll wind up with a screenful of reversed upper/lowercase characters.

To exorcise the Caps Lock demon, I've developed two utilities: Auto-

Caps and CapsWarn. Which of the two programs you'll want to use will depend on how you want your keyboard to work.

Before you can use either, you'll have to create them. To convert the Debug scripts shown in **Listing 1** (opposite) and **Listing 2** (page 64) to their executable equivalents, follow the simple instructions in the "Debug Scripts" section of "How to Use This Magazine" (page 69 in this issue).

A couple of caveats: AutoCaps and CapsWarn won't work on an original PC or on a PC-XT; those machines don't support the keyboard-intercept function, which the utilities need to operate (more on that later). Also, AutoCaps and CapsWarn work only with DOS programs (test them with DOS Edit or another DOS-based text editor); they won't work with Windows programs.

Fully Automatic

Your PC's Caps Lock feature doesn't mimic those old typewriters exactly. As noted above, Caps Lock shifts only the alphabetic keys into upper-

case; all other keys are unaffected. For the remainder of the keys, the action of the Shift key is independent of Caps Lock status.

The challenge for AutoCaps is to replicate the mechanical action of those old typewriters while adjusting to the new characteristics of your PC keyboard. If Caps Lock is on and you press either Shift key, Caps Lock turns off automatically only if the next key you press is alphabetic. When you release the Shift key, you'll be back in standard lowercase mode.

Use the following command to load the AutoCaps utility at the DOS command line:

AUTOCAPS

If you prefer to have AutoCaps active during your entire DOS session, add it to your AUTOEXEC.BAT file. AutoCaps will load itself into memory and begin monitoring your keyboard immediately. AutoCaps is memory resident, but requires only about 320 bytes of RAM.

On the Caps Lookout

If you're on the ball when it comes to the status of your keys, you may be using the Shift key to purposely override your keyboard when Caps Lock is on. In that case, the AutoCaps utility may be too intrusive for you. Maybe all you need is a gentle reminder. If so, you may find that the CapsWarn program is more your style.

After you load CapsWarn, it sits in memory and watches your keyboard. If Caps Lock is on and you press either Shift key, CapsWarn beeps your PC's speaker as if to say, "Excuse me, but Caps Lock is on and you're pressing Shift." You can ignore the warning and keep typing—you won't offend CapsWarn. Each letter you type produces a short beep. Turning off

Listing 1. AUTOCAPS.SCR creates the utility AUTOCAPS.COM, which turns off the Caps Lock function automatically.

```
N AUTOCAPS.COM
A 100
JMP 148
PUSHF
CMP AH,4F ;Kbd intercept?
JNZ 112 ;No, exit
TEST AL,80 ;Yes. Make code?
JZ 112 ;No, exit
POPF
JMP 0:0 ;Jump to old int
PUSH AX ;Save used
PUSH DS ; registers
PUSH AX ;Save scan code
SUB AX,AX ;Point DS
MOV DS,AX ; to low memory
POP AX ;Restore scan code
MOV AH,[417] ;Get shift byte
AND AH,43 ;Mask shift bits
CMP AH,40 ;Lock + Shift on?
JBE 143 ;No, exit
CMP AL,32 ;Between M...
JA 143
CMP AL,2C ;...and Z
JNB 13E
CMP AL,26 ;Between L...
JA 143
CMP AL,1E ;...and A
JNB 13E
CMP AL,19 ;Between P...
JA 143
CMP AL,10 ;...and Q
JB 143
AND Byte [417],BF ;Capslock off
CLI
POP DS ;Restore used
POP AX ; registers
JMP 10C ;Exit
MOV AX,[2C] ;Get PSP of environ
MOV ES,AX ; into ES
MOV AH,49 ;Release memory
INT 21 ; thru DOS
MOV AX,3515 ;Get Int 15h
INT 21 ; thru DOS
MOV [10E],BX ;Save it
MOV [110],ES
MOV AX,2515 ;Set new 15h
MOV DX,102 ; to our routine
INT 21 ; thru DOS
MOV DX,148 ;Keep this much
INT 27 ; go resident

RCX
6B
W
Q
```

End

Listing 2. CAPSWARN.SCR creates the utility CAPSWARN.COM, which beeps your PC's speaker if you press Shift while Caps Lock is on.

```

N CAPSWARN.COM
A 100
JMP 140
PUSHF
CMP AH,4F ;Kbd intercept?
JNZ 112 ;No, exit
TEST AL,80 ;Yes. Make code?
JZ 112 ;No, exit
POPF
JMP 0:0 ;Jump to old int
PUSH AX ;Save used
PUSH DS ; registers
SUB AX,AX ;Point DS
MOV DS,AX ; to low memory
MOV AL,[417] ;Get shift byte
AND AL,43 ;Mask shift bits
CMP AL,40 ;Lock + Shift on?
JBE 13B ;No, exit
PUSH CX ;Save register
MOV CX,20 ;# on/off
IN AL,61 ;Read sys port B
OR AL,3 ;Enable spkr/timer
OUT 61,AL ;Write to port
PUSH CX ;Save on/off cntr
MOV CX,32C8 ;This loop
LOOP 12F ; sets tone
POP CX ;Get on/off cntr
IN AL,61 ;Read sys port B

AND AL,FC ;Disable spkr/timer
OUT 61,AL ;Write to port
LOOP 125 ;On/off loop
POP CX ;Restore register
CLI
POP DS ;Restore used
POP AX ; registers
JMP 10C ;Exit
MOV AX,[2C] ;Get PSP of environ
MOV ES,AX ; into ES
MOV AH,49 ;Release memory
INT 21 ; thru DOS
MOV AX,3515 ;Get Int 15h
INT 21 ; thru DOS
MOV [10E],BX ;Save it
MOV [110],ES
MOV AX,2515 ;Set new 15h
MOV DX,102 ; to our routine
INT 21 ; thru DOS
MOV DX,140 ;Keep this much
INT 27 ; go resident

RCX
63
W
Q

```

End

Caps Lock or releasing the Shift key stops the beeping.

CapsWarn is also memory resident, using only 332 bytes. Use the following command to load the CapsWarn utility at the DOS command line:

CAPSWARN

If you prefer to have CapsWarn run automatically, add it to your AUTOEXEC.BAT file.

Inner Workings

When IBM released its original PC-AT, it added a new function to the BIOS: the keyboard intercept (Int 15h, AH=4Fh). It works in a unique way: Instead of your program calling the function, as is the case for standard BIOS services, this function calls your program.

Each time you press a key, the BIOS calls the intercept routine to let a program change or absorb keystrokes. The default keyboard-intercept routine leaves the key-

stroke unchanged. Any program can hook into this service, however, and take the change to examine or switch keystrokes. Both AutoCaps and CapsWarn use this technique to monitor your keyboard.

When you load either of these utilities into memory, it intercepts Interrupt 15h, putting itself into the loop to monitor keystrokes as they happen. As you press each key, these utilities check the keyboard-status byte in low memory. If the byte indicates that Caps Lock is on and you're pressing either or both Shift keys, the utilities spring into action.

At this point, CapsWarn beeps your speaker and exits. AutoCaps does a further check to determine whether you've pressed an alphabetic key. If so, it turns off Caps Lock and then exits.

With the CapsWarn or AutoCaps utility in place, you'll never reverse your upper- and lowercase characters again—but don't forget to turn off the lights when you leave the room! ■

DOS Tip

DOS Taboos

As you work to make life at the DOS prompt more livable, creating batch file after batch file, remember that DOS reserves several device names for its own use. Don't use the following names for any of your batch files: AUX, CLOCK\$, COM1, COM2, COM3, CON, LPT1, LPT2, LPT3, NUL, and PRN.

If you're working in a text editor, such as DOS's Edit program (EDIT.COM) and use a name such as AUX.BAT, DOS warns you that the filename already exists. But if you're using COPY CON to create a short batch file at the DOS prompt, you'll see a "1 file(s) copied" message after pressing Ctrl+Z (or F6) to end the batch file. When you type DIR AUX.BAT to check on the existence of the file, however, DOS issues a "File not found" message.

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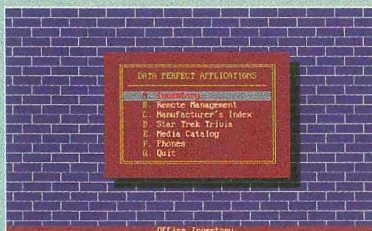
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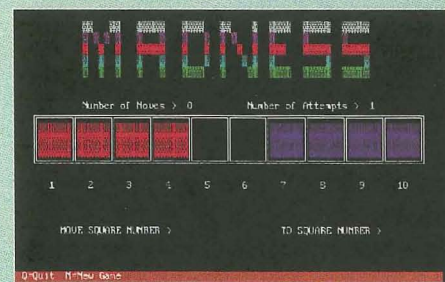
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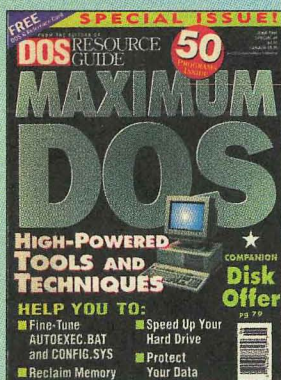
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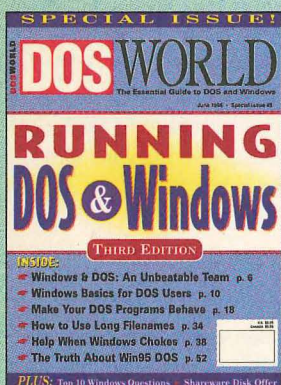
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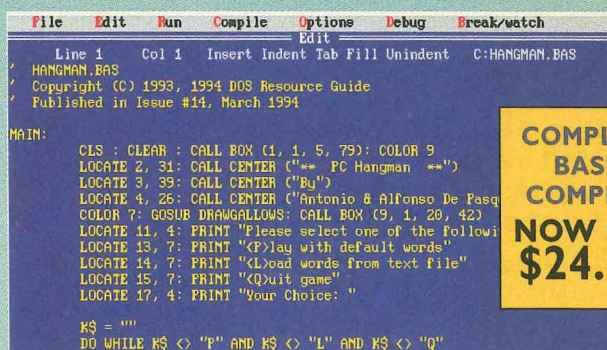
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REPLACEABLE TEXT

Articles in *DOS World* will often give you a command that includes text you must replace with your own information. This replaceable text is in *italics*. For example, in the following command, you'd replace *filename* with the name of your own file:

```
COPY A:filename B:filename
```

THE CONFIG.SYS FILE

In your root directory is a file called CONFIG.SYS. Like AUTOEXEC.BAT, this file is in ASCII, and you can view your CONFIG.SYS file with the TYPE command. A typical CONFIG.SYS might look like this:

```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS
DOS=HIGH,UMB
FILES=50
BUFFERS=10
SHELL=C:\DOS\COMMAND.COM
C:\DOS\ /E:1024 /P
DEVICE=C:\DOS\ANSI.SYS
DEVICE=C:\DOS\SETVER.EXE
```

The rules for handling CONFIG.SYS are the same as they are for AUTOEXEC.BAT: Always back up the original file before you modify it and always have an emergency boot disk available. As with AUTOEXEC.BAT, changes you make to CONFIG.SYS won't take effect until you restart your computer.

ANSI.SYS AND THE ESCAPE CHARACTER

When an article says you must have ANSI.SYS installed, it means that the MS-DOS file ANSI.SYS should be in your \DOS directory, and the following line should be in your CONFIG.SYS file:

```
DEVICE=C:\DOS\ANSI.SYS
```

Some articles that discuss ANSI.SYS will also ask you to create a batch file that uses the escape character. Unfortunately, there's no uniform method of doing so. If you use EDIT, the text editor that comes with MS-DOS, you can make an escape character by pressing Ctrl+P and then the Esc key. The escape character appears on screen as a small left-pointing arrow. If you're using another text editor or word processor, check its instructions for information on how to enter the escape character.

How to Use

THE AUTOEXEC. BAT FILE

Most people have a batch file called AUTOEXEC.BAT on their hard disks. If you want to look at it, first go to your root directory by typing CD\. Type DIR to make sure AUTOEXEC.BAT is there. Then type the following command:

```
TYPE AUTOEXEC.BAT | MORE
```

A simple AUTOEXEC.BAT file might look like this:

```
@ECHO OFF
PROMPT $P$G
PATH=C:\DOS;C:\WINDOWS;C:\WP51;C:\BAT
C:\DOS\SMARTDRV.EXE
C:\MOUSE\MOUSE.COM
C:\DOS\DOSKEY.COM
SET TEMP=C:\TEMP
```

When a *DOS World* article instructs you to modify your AUTOEXEC.BAT file, always make a backup copy of the original AUTOEXEC.BAT first. The most common names for your backup copy are AUTOEXEC.BAK or AUTOEXEC.BK. The latter lets you save different versions of your backups—for example, AUTOEXEC.BK1 and AUTOEXEC.BK2. You create a backup copy with the following command:

```
COPY AUTOEXEC.BAT AUTOEXEC.BAK
```

Also, you should have an emergency boot disk available whenever you modify AUTOEXEC.BAT. (See the accompanying section on the facing page, top.) It will let you access your hard drive in case you make an error that locks up your computer. Changes you make to AUTOEXEC.BAT won't take effect until you restart your computer.

BATCH FILES

A batch file is a text file that tells MS-DOS to do a series of tasks. The filename of a batch file always ends with the extension .BAT.

A batch file must be in plain-text format. For example, a batch file might consist of the following lines:

```
CD\
DIR /S /P
```

This batch file moves you to the root directory (CD\) and then gives you a list of all files in all directories (/s), pausing after each full screen (/p).

Every batch file needs a name. In such cases, you should pick your own name. Batch-file names carry the same limitations as any other DOS filename; you're limited to eight characters, plus a three-character extension. A batch-file name must always use the .BAT extension.

To avoid confusion and unexpected results, don't give any batch file the same name as another program or DOS command. For example, VCOPY.BAT is an acceptable name for a batch file, but not COPY.BAT or XCOPY.BAT, because COPY and

XCOPY are the names of DOS commands. To run or execute a batch file, type its name at the DOS prompt. For example, to run a batch file called VCOPY.BAT, type VCOPY at the DOS prompt.

Creating and Saving

Using EDIT. If you have DOS 5 or later, you can create a batch file using EDIT. EDIT usually resides in your DOS directory. Type EDIT and enter your batch file. When you're done, press Alt+F and choose the Save option. Type the name of your batch file (make sure you add the extension .BAT) and press the Enter key.

Using other word processors. Most word processors don't save files in plain text; they include other characters, such as control characters that handle such matters as page formatting and typefaces. Most word processors, however, do give you an option to save in plain text. The procedure varies from one word processor to the next. For example, when you save a file in WordPerfect 5.1, you choose ASCII Text (DOS) as your Format option.

This Magazine

MAKING AN EMERGENCY BOOT DISK

Sometimes a *DOS World* article will suggest that you create a *bootable floppy*—a floppy disk that serves as an emergency system disk. That is, if your computer for some reason can't access your hard drive, you can start your computer from the emergency floppy. You should always have an emergency system disk available, but it's particularly important when you modify AUTOEXEC.BAT or CONFIG.SYS because you may change those files in such a way that your computer won't start from the hard drive. To create a system disk:

1. Insert a floppy disk in drive A.
2. At the command line, type **FORMAT A: /S** (all existing information on the floppy will be lost).

DOS first formats the floppy disk. Then it copies three DOS system files to the floppy disk: IO.SYS, MSDOS.SYS, and COMMAND.COM.

The first two are hidden files; you won't see them if you type **DIR A:**. If you have the disk-compression program DoubleSpace on your computer, the **FORMAT** command above will also copy **DBLSPACE.BIN**, a third hidden file, to the floppy disk.

After you've created your system disk, you should copy a few other basic files to your floppy. Go to your **\DOS** directory and copy the following files: **FORMAT.COM**, **EDIT.COM**, **EDIT.HLP**, **QBasic.EXE**, **UNDELETE.EXE**, **CHKDSK.EXE**, **FDISK.EXE**, and **SETUP.EXE**.

DEBUG SCRIPTS

A Debug script is a list of assembly-language instructions you convert to an executable program using the program **DEBUG.EXE** in your **\DOS** directory.

Creating the script. A Debug script must be in plain text. The procedure for creating the script is the same as for creating a batch file. You can use DOS's **EDIT** program, or you can use a different text editor or word processor and save the script in plain text format.

Creating an executable program. After creating and saving the script, type the following command at the DOS prompt:

```
DEBUG < filename
```

where *filename* is the name of the Debug

script you created. For example, if the name of your Debug script is **KEYPRESS.SCR**, you'd type this line:

```
DEBUG < KEYPRESS.SCR
```

at the DOS prompt. The executable program created by Debug will have the extension **.COM**. The name of the executable file is determined by the contents of the script. Our convention is to use the same name for the executable file as we do for the script. Thus, the executable file created by **KEYPRESS.SCR** will be named **KEYPRESS.COM**. Once you've created the executable file, you run it by typing its name at the DOS prompt. To run **KEYPRESS.COM**, type **KEYPRESS.**



PATHS AND THE PATH STATEMENT

DOS World articles often tell you to make sure that a particular file is in a directory included in your **PATH** statement. This lets you run a **.COM**, **.EXE**, or **.BAT** file from any directory on any drive.

For example, an author might tell you to create a batch file called **TEST.BAT**, put it into a subdirectory called **\BAT**, and put the subdirectory into your **PATH** statement. You can then execute **TEST.BAT** by typing **TEST** from anywhere on your drives, without having to change to the **\BAT** directory first.

The **PATH** statement is a line in your **AUTOEXEC.BAT** file. It gives DOS a list of directories to search for requested files. Here's an example:

```
PATH=C:\DOS;C:\WINDOWS;C:\BAT
```

When you type **TEST** at the DOS prompt, DOS looks for the program first in the current directory, then in the root directory, and then, in order, the **\DOS**, **\WINDOWS**, and **\BAT** directories. When it finds **TEST.BAT** in the **\BAT** directory, it executes the batch file.

Continued on page 70

BASIC DEFINITIONS

DOS prompt. Also known as the *command prompt*. By default, the DOS prompt looks like this: **C:\>**. This is where you type the instructions to run programs or DOS commands.

Boot, boot up, reboot. The process of starting or restarting your computer. Turning on your computer is *booting* or *booting up*. Pressing the key combination **Ctrl+Alt+Del** restarts, or *reboots* your computer. So does pressing the reset button, if your computer has one.

Extensions. When we refer to a program by its common name (for example, the DOS command **FORMAT**) without an extension, you can assume that the extension is **.COM** or **.EXE**. When we refer to a batch file, we always include the extension **.BAT**. **QBasic** program names must always include the **.BAS** extension.

ASCII. American Standard Code for Information Interchange. For our purposes, an ASCII file is a plain text file, one that consists entirely of

the characters you see on your keyboard.

Directories. Your hard drive has a main directory called the *root* or *home* directory. Directories created off the root directory are called *subdirectories*. When we provide the name of a subdirectory, it will look something like this: **\WORD\FILES**. Here, the root directory has a subdirectory called **WORD**, which in turn has a subdirectory called **FILES**.

File placement. We assume that the following files are in your root directory: **AUTO-**

EXEC.BAT, **CONFIG.SYS**, and **COMMAND.COM**. We also assume that your DOS files are in a DOS subdirectory, usually called **\DOS**.

Keystroke combinations. When you should hold down one key while pressing a second, we indicate it this way: **Alt+F4** (press the **Alt** key and hold it down while you press the **F4** key). When you should press one key, release it, and press another, we indicate it this way: **Alt, F4** (press the **Alt** key, release it, then press the **F4** key).

QBASIC PROGRAMS

QBasic is the programming language included in all versions of MS-DOS since version 5. The name of a QBasic program always ends with the extension .BAS.

Typing in the listing. Type QBASIC at the DOS prompt and press Enter to start. Now type in the listing as printed, pressing Enter at the end of each line. Note that when a line in the listing is indented two spaces from the line above and doesn't start with a command or keyword, it's a continuation of the previous line. Other indentations, or none at all, indicate a new line.

Subroutines and functions. QBasic listings often include subroutines and functions, and typing them is confusing at first. They begin with a line containing the keyword SUB or FUNCTION. Note that when you type a SUB or FUNCTION line and press Enter, all other lines you've typed will disappear from view. This can be disconcerting for beginning programmers. There's nothing to worry about—your listing is safe. To avoid screen clutter, QBasic simply hides other parts of your listing when you're typing in a subroutine or function. To see the other parts of your program, open the View menu at the top of the QBasic screen, then select SUBS. The SUBS dialog box will appear, letting you select the part of the program listing you want to view.

Saving a listing. Save your partially completed listing as you go along, rather than waiting until you've typed in the whole thing. To save, open the File menu, choose Save, and type in a filename when QBasic prompts you. We suggest using the filename specified in the magazine article. Subsequent saves of

your listing won't prompt you for a filename, but will instead use the filename indicated the last time you saved the listing.

Running a program. After you've typed in the entire listing and saved it a final time, you can run the program by selecting Start from the Run menu or pressing Shift+F5. If QBasic finds an error, it will stop the program and highlight that line. To run a QBasic program (a .BAS file) stored on your hard drive, start QBasic, then select Open from the File menu. Choose from among the .BAS files displayed in the open dialog box to load the program into QBasic, then select Start from the Run menu or press Shift+F5. To stop a QBasic program, press Ctrl+Break; select Exit from the File menu to return to DOS.

DOS World BBS. Typing and debugging a long listing is time-consuming. If you have a modem, our listings are always available on *DOS World's* bulletin-board system (BBS) at 603-924-3181. There are no connect-time charges; you pay only for the phone call. Set your communication program to 8 data bits, no parity, 1 stop bit (8, N, 1). Dial the number and wait for the "Connect" message. If you're a first-time user, the system will ask you to enter your name and choose a password. Then it will display a general information screen, followed by a questionnaire requesting your address, phone number, and so on, so that we may set up your account. From this point, on-screen prompts are the same for all users. A series of messages present the latest BBS news; press Enter after each message to go to the next screen. From the Bulletin Menu, Bulletin #1 offers information on navigating the Main and File Menus, with instructions for listing, marking, searching for, and downloading files. ■

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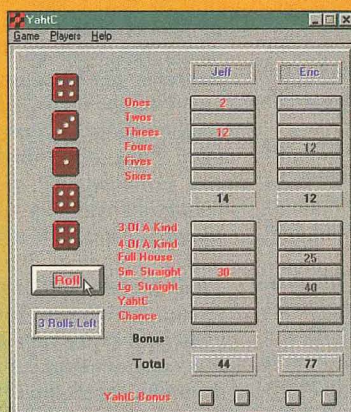
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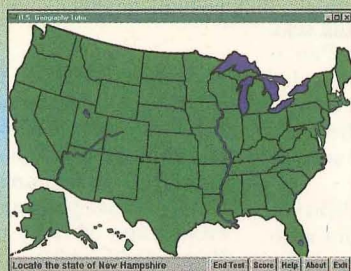
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WAXMAN. Play chess against the computer with WAXMAN, the pocket chess game for Windows. The program features an "easy" mode and a variety of settings, so that you can tailor WAXMAN to your skill level.

U.S. Geography Tutor. This geography teaching and testing program displays a map of the United States, then asks a series of questions. Students (and their parents!) respond by clicking with the mouse cursor on the correct spot on the map. The program keeps score and lets you monitor your progress.

YahtC. Players roll five dice up to three times to produce scoring combinations. Go for three or four of a kind, a full house, large and small straights, and so on. Combine luck and strategy to achieve a high score. Fun for both kids and adults.

Graphics. The Accessory Pak also includes a variety of graphics files you can use as wallpaper to add pizzazz to your Windows 95 desktop.

PDGR/MAX/APK

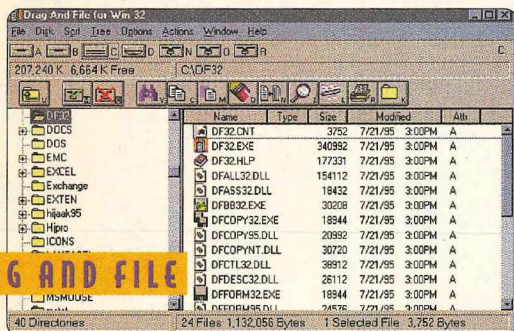
Most of the programs in the Accessory Pak are shareware programs. Shareware is "try before you buy" software. The programs are made available to you for evaluation at a small fraction of their retail prices. You may evaluate each program in the Accessory Pak for a specified period of time. Then, if you decide to continue using the program, you are required to contact the vendor and pay a fee to become a registered owner of the program. We wish to thank the program vendors for their generosity in letting us make this software collection available for your evaluation.

Maximize Power Pak for Windows 95

Six GREAT Programs to Make Windows 95 Even Better

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A carefully selected half-dozen of the very best new shareware programs, each designed to let you realize the full power of Windows 95.



DRAG AND FILE

Streamlines and simplifies file management under Windows 95. Offers several unique functions, such as a directory finder, a duplicate-file finder, and a DOS command utility.

Drag and File works at several levels of sophistication and integrates with other management and utility programs. The result is an uncommon degree of flexibility. When you need more, Drag and File delivers.

Drag and File offers a broad range of file management tools: Drag-and-drop file move, copy, and delete • Viewing of all text and most graphics files • Single-click execution of most-frequent tasks from a toolbar • Configurable hot-key control for hands-on keyboard execution • Formatting and disk copying for floppy diskettes • Full access to Windows 95 functions like creating shortcuts, Quick View, and file properties.

TEXTPAD

Satisfies your most demanding text-editing requirements. TextPad is easy for beginners, yet includes all the power needed by experienced users. Edit multiple files simultaneously, with up to two views on each file. Drag and drop text between files. Edit huge files, limited only by the amount of memory in your system.

In addition to the usual cut-and-paste capabilities, you can correct the most common typing errors with commands to change case, and transpose words, characters, and lines. Other commands let you indent blocks of text, split or join lines, and insert whole files.

Any change can be undone or redone, right back to the first one made. In-context help is available for all commands, and in-context menus pop up with the

right mouse button. If Windows Notepad is your only experience with a text editor, you'll be astounded at what TextPad can do!

FastExit is the easy way to exit from Windows 95! Just double-click on the FastExit icon in the Win95 program tray in the lower-right corner of the Taskbar. You'll exit Windows before you know it!

FASTEXIT

EzDesk is a small Windows 95 utility that manages the layout of your desktop and much, much more. EzDesk sits in the program tray on the Taskbar and lets you control many features of Win95. With EzDesk, you can: • Preserve the location of desktop icons for each display resolution • Hide or minimize all windows, then restore them • Clear the Documents menu • Clear the Find Files and Folders most-recently-used list • Clear the contents of the Run... history • Shut down Windows quickly via a hot key. EzDesk is a little program that does a lot!

EZDESK

This handy utility installs as an extension to Explorer, and is then available every time you right-click on a folder. Folder Size appears as an option on the menu, and when selected, scans the folder and all its subfolders. It then displays a pop-up summary of the total number of files, and their total size, in kilobytes. It's a quick and easy way to discover which folders are occupying space on your hard disk.

FOLDERSIZE

WideOpen lets Word 6.0 take advantage of many new features of Windows 95. After you install WideOpen, Word 6.0 will use the new Windows 95 File Open and Save dialog boxes, and will support long filenames and other features of Windows 95. Now that you've switched to Windows 95, take full advantage of it by updating your word processor! Requires Word 6.0.

WIDEOPEN

The programs in the Maximize Power Pak are shareware. That means you're free to use and evaluate each program for a period of time, but then must pay a registration fee if you continue using the program beyond the evaluation period. Maximize Windows is providing these programs for your evaluation at low cost on a "try-before-you-buy" basis with the permission of the program authors.

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PC Resources

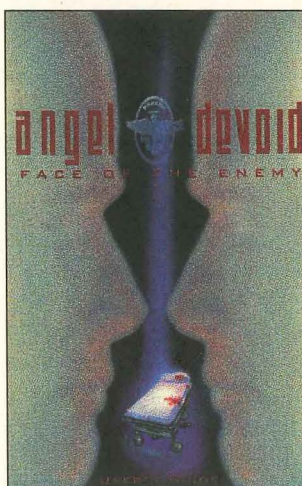
News and reviews of DOS and Windows enhancements, upgrades, and products

Edited by Eileen Terrill

MEAN STREETS

Mindscape (415-897-9900, 800-234-3088) pumps up the volume in **Angel Devoid: Face of the Enemy**, a new DOS-based interactive thriller (street price about \$50). You play Jack Hard, a 31st-century detective in pursuit of master criminal Angel Devoid—super-warrior, terrorist, assassin, and all-around evildoer. When a bizarre accident forces you to undergo reconstructive surgery, you awake to find yourself with the face of the man you're pursuing—and so the hunter becomes the hunted. Your survival depends on infiltrating the darkest corners of Neo-City, an ominous urban jungle where death lurks in every shadow and a myriad of unpredictable predators await. Your cop instinct and fast reflexes have to keep you alive long enough to discover Angel Devoid's true identity.

The accompanying manual includes basic instructions for game play and a pulp-fiction-style "prequel" with background information on our hero's life in the Paradise City PD, plus a convoluted account of Martian colonization. Jack and Angel have history. Seems that Angel, former



commander of the Martian security force Death Company 7, was court-martialed following a civil war—and acquitted. He then served as chief of police of Paradise City for a while, but disappeared right before a bomb exploded at the station house, nearly killing Jack. Later, Angel murdered the mayor in broad daylight and managed to escape again. (Think of it as a *City Hall*-meets-*Virtuosity* kind of thing.) So Angel's on the loose, and Jack's out for blood.

According to Mindscape, what sets Angel Devoid apart is its extensive live-action video, featuring a cast of 24 professional actors. Scenes were filmed against blue-screen backgrounds and combined with computer-generated sets, special effects, and an original soundtrack. Game play follows a nonlinear design; you can overcome obstacles and perform tasks in almost any order and at your own pace. A richly detailed story line offers multiple subplots, three separate endings, and 30 ways to die.

Angel Devoid requires a 486 DX2 PC (66MHz) with 8MB of RAM, DOS 5 or later, double-speed CD-ROM drive (quad-speed recommended), 1MB Super VGA card, Sound Blaster-compatible audio card, and Microsoft-compatible mouse. Also available at bookstores and software outlets is **Angel Devoid: The Official Strategy Guide**, a new entry in Prima Publishing's *Secrets of the Games* series (800-531-2343; \$19.95 plus \$4 shipping).

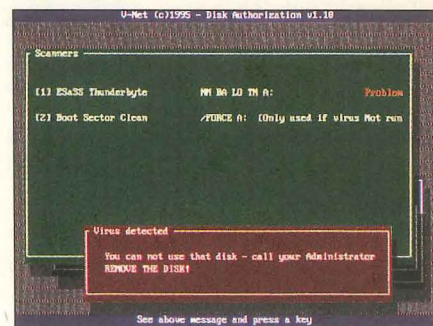
Ounce of Prevention

Business, government, and school computers now have another weapon in the fight against viral infections passed along via floppy disk or downloaded inadvertently from the Internet. SecureNet's

V-Net Gold 2.0 (\$132.40 per copy; minimum of five copies) protects systems by authorizing disk and pro-

gram use and by cleaning any boot viruses automatically. The package also includes Thunderbyte's virus-detection software TBSan; V-Net Gold is compatible with other virus scanners, as well, and can be used with multiple scanners. According to SecureNet, once V-Net Gold is installed on a network server, individual PC users can't bypass it.

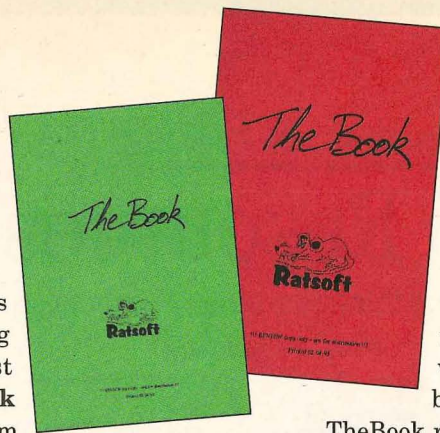
Technical support for V-Net Gold is available 24 hours a day, seven days a week, via a toll-free phone line. For



more information, contact the company at 206-776-2524 or 800-673-3539, or on the World Wide Web at <http://www.securenet.org>.

NEATNESS COUNTS

Here's a new way to update your pocket address book as often as you like without crossing out and scribbling all over it: Just generate a fresh one with **TheBook 3.0**, a \$35 shareware program from Ratsoft (312-585-4472; CompuServe 100016,3406). TheBook is a simple DOS-based name-and-address manager that can print from your Hewlett-Packard LaserJet or



DeskJet in a number of formats, including A5 ring-binder pages and credit-card-sized booklets for your wallet. Data entry and selection of print options are menu driven, with context-sensitive help just a keystroke away.

TheBook also includes a quick-lookup feature; start the program by typing in the first few letters of the name for which you're searching, and the software displays matching names with corresponding addresses and phone numbers. Then press any key to exit to DOS.

TheBook requires a 386-based or later PC, DOS 3.x or later, 2MB of RAM, 2MB of hard-disk space, and EGA or VGA video. The program is available from CompuServe's PCAPP library 7, filename TB_EXE.ZIP.

Roll Over Beethoven

If you're a budding composer who likes the convenience of computerized notation—but you don't

want to give up your acoustic instrument for it—check out **Autoscore**, a MIDI-conversion utility from Wildcat Canyon Software (510-527-8425; \$150). Autoscore's microphone (which plugs into your system's sound card) and software together act as a synthesizer for your sax, violin, guitar—even your own voice.

You install Autoscore in Windows and access it as a MIDI input device within any of a number of compatible "host program" sequencers and notation packages. Play (or sing) into the microphone while in the host program and Autoscore converts each note into written music on screen.

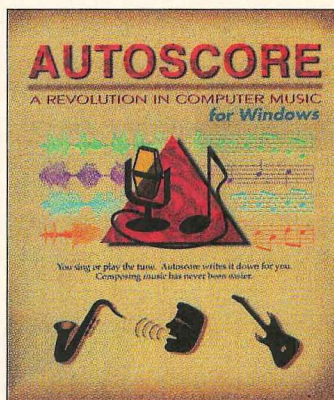
If your sequencer or notation program isn't directly compatible, you can use Autoscore's own sequencer, a module called Recording Session, to record multiple tracks and save them as a standard MIDI file, which you can then import into any MIDI-based music program for editing, arranging, and so on.

Recording Session includes its own notation, editing, and playback capabilities. It can't print your compositions; you'll need a separate program for that.

Although Autoscore can't handle chords, dialog boxes offer a number of controls to enhance the program's recognition of single pitches. You may select either a key for Autoscore's output to the host program (to compensate for off-key input) or pitch-bend mode for slides between notes, as well as volume tracking and any of several preset instrument filters, designed to accommodate the varying acoustic characteristics of different classes of instruments (voice, guitar, wind/brass, string, and rhythm).

You may also edit any filter and save the new settings under a different name for later recall.

Adjustable filter elements include pitch range (with high and low notes marking the boundaries of Autoscore's output), note length (sliding from "mostly long" to "mostly short"), and volume threshold (the minimum volume the program will recognize, sliding from "allow quiet notes" to "only loud notes"). Autoscore requires a 386-based or later PC (486 recommended), 4MB of RAM, Win3.1, and a sound card.

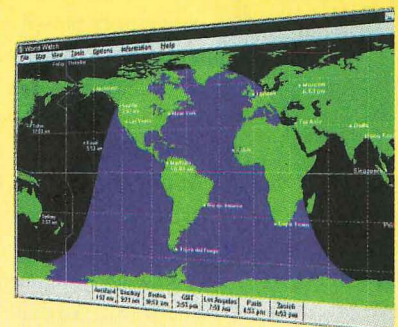


GLOBAL VILLAGE

PC users who work in government, international commerce, banking, or diplomacy may want to take a look at Express Technologies' **World Watch** (414-337-1640, 800-757-8463; \$42.95; upgrade \$17.95).

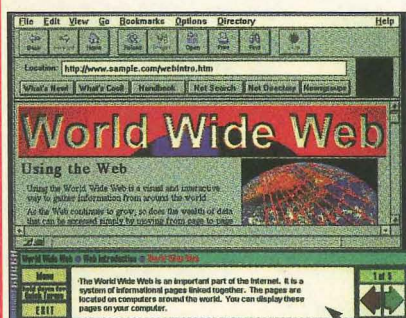
This Win95 program shows the current time for locations around the globe, displayed on a world map, with a highlighted expanse showing areas currently in daylight. Individual digital clocks at the bottom of the screen continuously update local times for any cities you select.

You control the size and position of the program's window display; the package also includes a screen-saver version of the software. Site and network licenses are available.



Dead Reckoning

Everybody learns better by doing, and nowhere is the hands-on approach more effective than in computer training. That's the principle behind **Internet Coach for Netscape Navigator**, the commercial version of a program developed originally for the White House staff by APTE (847-866-1872, 800-494-1112; \$49.95 plus \$5 shipping single user; network versions and site licenses available).



The program's step-by-step tutorial features interactive Internet simulations, complete with colorful graphics, sound, and animation; resource modules offer quick answers, shortcuts, a glossary, and troubleshooting tips. You'll learn how to browse the Net and the Web; access news, data, shopping, and multimedia; and download files.

APTE emphasizes the benefits of Internet efficiency: Novice Internet hands save time and money by learning the basics off line, while experienced Web-surfers can call up the program's reference sections during on-line sessions instead of stopping to search through manuals.

Internet Coach requires a 486-based or later PC, 4MB of RAM (8MB recommended), Windows 3.1 or 95, 8MB of hard-drive space, and a Super VGA card.

Krolman has introduced a new photo utility for teachers, sales reps, fundraisers, and other public speakers who rely on "visuals."

PictureThis (\$99; 800-388-3639, 617-242-0635) converts scanned, CD-ROM, and other digital images to full-screen displays, ready for insertion into demos prepared with any standard presentation program (such as Microsoft PowerPoint, Lotus Freelance, or Corel Presents).

On the Big Screen



Load your electronic photo into the **PictureThis** program, select the portion of the image you want to show, and click on Send to Slide; **PictureThis** optimizes the color and resamples it at 640-by-480-pixel resolution,

producing a sharp-looking, fast-loading full-screen slide ready for incorporation into your demo, according to the company. **PictureThis** requires a 486-based or later PC, 8MB of RAM, and Windows 3.1 or Windows 95.

Fingertip Control

What do you get when you cross a mouse with a trackball? A space-age-looking critter called **Felix**, that's what. New from Altra, **Felix 3.0 for Windows** (\$119.95; 307-328-1342; orders 800-445-6778) consists of a 6-inch-square base topped by a movable, round "handle" with three buttons. According to Altra, **Felix's** ergonomic design means that you exercise only your fingers, not your wrist, as you push the little handle around a 1-inch-square "Control Zone" cut into the top of the base, thus drastically reducing your risk of carpal-tunnel syndrome and other stress injuries.

An optical tracking system is built into **Felix's** Control Zone, so there's no dirt-collecting rollerball or mousepad; you can put the unit on your lap, the arm of your chair, or wherever you're most comfortable computing. Altra says that the unit senses finger speed: When you move it slowly, you get pixel-by-pixel precision; when you rev up, you can zip across the screen. According to the manufacturer, **Felix** adjusts to the size of your display, so you don't have to pick it up and start over as you often do with a regular mouse. **Felix** works with the Microsoft Windows mouse drivers you already have and is Win95 Plug-and-Play compatible; the unit comes with DOS drivers, as well. **Felix** plugs into your PC's standard mouse/trackball connector and comes in two models: serial (for rectangular ports) and PS/2 (for round ports).

Altra is offering a try-before-you-buy deal called the "5-minute **Felix** test." The company will bill your credit card \$7.95 for shipping; if you don't like **Felix**, mail it back using the postage-paid return label within 30 days; if you keep **Felix**, the company will charge you an additional \$69.95 (\$50 off the suggested retail price). The company is including a bonus copy of **ZipZapp**, a database of ZIP codes and area codes for every city and town in the U.S.; it's yours to keep even if you return **Felix**. The unit comes with a one-year guarantee (free repair or replacement within that time).



Continued on page 78



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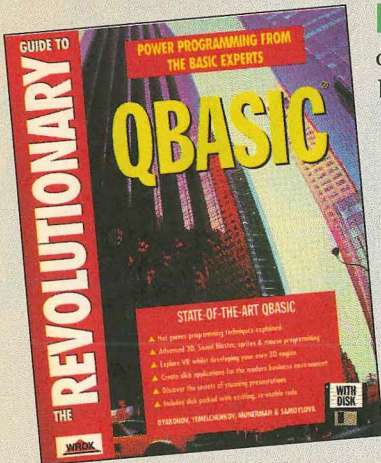
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PC BOOKSHELF



■ Ya gotta love the quirky audacity of any bright-red book called *The Revolutionary Guide to QBasic*, when it's written by a quartet of teachers/engineers from Smolensk. Vladimir Dyakonov, Evgeny Yemelchenkov, Victor Munerman, and Tatyana Samoylova have produced a monumental tome covering

everything from syntax to sort algorithms to module partitioning, and including a light-hearted approach to the special problems of animation, multimedia, and game development.

Published by Wrox Press (312-465-3559; \$34.95, with companion disk) in a lively translation from the Russian by Vladimir Naidonov—and despite the unintentional humor of a few mixed metaphors (“amongst the whole enchilada of topics,” “knock up a quick simulation,” “this is one huge meaty twig, ideal for clogging someone with”)—this is one heavy-duty, comprehensive volume of serious programming instruction. Plenty of screen shots, sample listings, tables, and diagrams help break it down into manageable chunks.

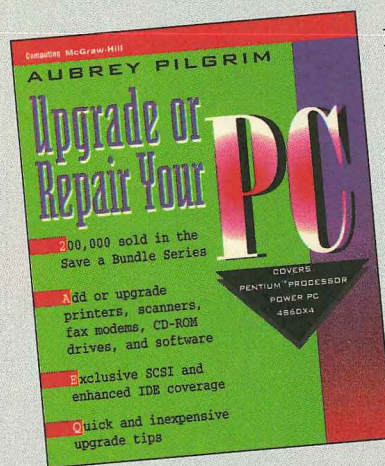
■ From Abacus (800-451-4319, 616-698-0330) come two new books for PC users who rely on file compression to save time, disk space, and money.

The ZIP Bible, by Istok Kespert (\$24.95, with companion CD-ROM), examines both basic and advanced aspects of data compression and describes the features and advantages of several popular compression programs. Among the topics covered are password protection, file sharing, using batch files to crunch data, restoring damaged archives, creating self-extracting files, and adding notes to compressed files. The companion CD-ROM contains eight shareware and freeware compression titles, including WinZip, PKZip, and LHarc.

Zippping for Beginners: “No Experience Required”, by the Abacus Group (\$14.95, with companion disk), offers

a step-by-step approach to using the three most popular compression utilities (supplied on the accompanying floppy): PKZip, WinZip, and WinZip for Windows 95. Novices should love this introductory guide, with its simple instructions, abundant screen shots, large type, and lots of white space. Topics include basic zippping and unzip- ping, viewing a list of a compressed file's contents, zippping multiple files, and working with files spanning multiple disks.

■ For the truly ambitious do-it-yourselfer, McGraw-Hill (212-221-5949, 800-2-MCGRAW orders) offers updated versions of four titles in Aubrey Pilgrim's *Save a Bundle* series.

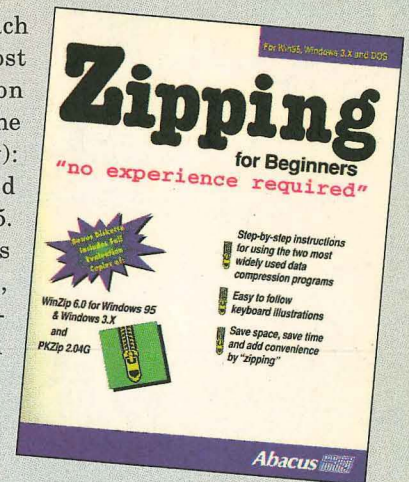


Upgrade or Repair Your PC: 4th Edition (\$26.95) explains the intricacies of your computer's components, plus how to fix systems and install peripherals; this update includes information on newer chips, such as the Intel 486DX4, the Pentium processor, and the PowerPC, as well as SCSI and MIDI interfaces, CD-ROM drives, and modems.

In *Build Your Own 486/486DX: 3rd Edition* (\$19.95), Pilgrim offers advice on how to select the right components and then use common household tools to put the machine together. Background information covers monitor types, keyboards, printers, memory upgrades, hard drives, and more. One section lists sources of components and tips on buying via mail order.

Build Your Own Pentium Processor PC: 2nd Edition (\$19.95) provides step-by-step instructions for assembling your own custom system, with special sections on troubleshooting and repair and finding components and peripherals at the lowest prices.

For business, education, and just plain fun, *Build Your Own Multimedia PC: 2nd Edition* (\$39.95, with companion CD-ROM) shows you how to construct a low-cost



DW MARKETPLACE

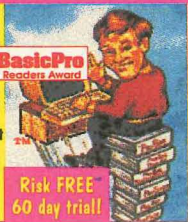
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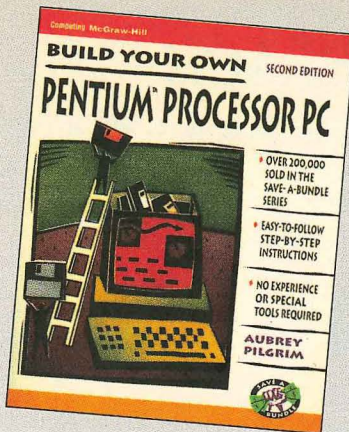
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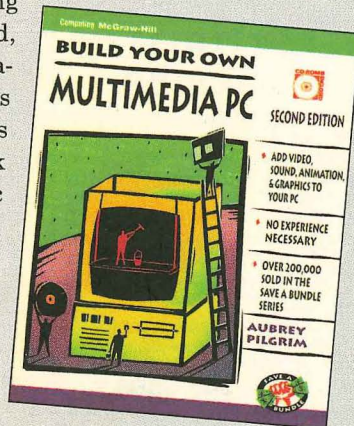
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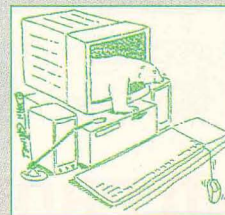


From Prentice Hall's Professional Technical Reference division (212-755-8900, 800-947-7700 or 515-284-6751 orders) and SunSoft Press come four books on Java, Sun Microsystems' object-oriented language—the hottest thing going for programming multimedia software and interactive sites for the World Wide Web.

Instant Java, by John A. Pew (\$29.95, with companion CD-ROM), shows both novice and experienced software authors how to incorporate special effects—such as text manipulation, sound, and animation—into Web pages. **Just Java**, by Peter van der Linden (\$34.95, with companion CD-ROM), offers developers an introduction to object-oriented programming in the author's trademark humorous style. (He's also the creator of *The Official Handbook of Practical Jokes*.) **Java by Example**, by Jerry R. Jackson and Alan L. McClellan (\$34.95, with companion CD-ROM), aimed at professional programmers, uses simple-to-complex applet development to teach the language's key features. **Core Java**, by Gary Cornell and Cay S. Horstmann (\$39.95, with companion CD-ROM), is the most advanced book in the series, with a comprehensive analysis of Java's syntax and a comparison of the language's features with those of C++ and Visual Basic.

The compact discs accompanying these volumes contain the source code referred to in each book as well as the Java Developer's Kit and a selection of customizable applets for Java programmers.

From Peachpit Press (510-548-4393, 800-283-9444) come four new entries in its *Visual QuickStart Guide* series. **Excel for Windows 95**, by Maria Langer (\$16.95), offers a wealth of screen shots to guide you through this spreadsheet package's many complex features, including the software's new navigation and number-analysis tools. **PageMaker 6 for Windows**, by David Browne (\$16.95), attempts to flatten this desktop-publishing program's steep learning curve with clear text instructions and illustrations. **Photoshop 3 for Windows**, by Elaine Weinmann and Peter Lourekas (\$19.95), is a how-to reference covering the software's basic techniques of photo manipulation and correction, with a list of keyboard shortcuts and step-by-step suggestions detailing the easiest methods to accomplish the tasks you have in mind. **HTML for the World Wide Web**, by Liz Castro (\$17.95), lists the Hypertext Markup Language codes you'll need to design attractive, professional-looking Web pages. Included are illustrations of completed pages with the corresponding codes that produced them, as well as lots of tips for avoiding common design pitfalls. Castro's book is targeted at both novice and experienced Web designers and covers a wide range of topics, from formatting text and creating company logos to incorporating images, using links, and producing maps and clickable graphics, complete with sound and video.

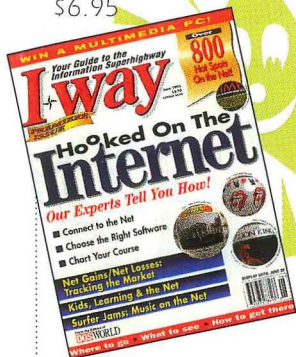


Also from Peachpit Press, **The Little PC Book: 2nd Edition**, by Lawrence J. Magid (\$18.95), offers simple, plain-English information on computer basics, including buying and setting up a PC and using peripherals. This edition has been updated to cover Windows, multimedia, CD-ROM, and the Internet. One unique feature is its "cookbook" approach, with more than 100 "recipes" for performing common tasks in Windows 3.1 and Win95.

For the digital artists and graphic designers among you, **Photoshop in 4 Colors**, by Mattias Nyman (\$22.95), explains how to reproduce and manipulate color images (including scanning, color correction, separation, and background stripping) in the latest versions of Photoshop and QuarkXPress, with a number of before-and-after screen shots illustrating the software tools you can use to tweak or radically alter images. **The Photographer's Digital Studio: Transferring Your Photos into Pixels**, by Joe Farace (\$24.95), applies darkroom techniques and the standard principles of photography to the new realm of digital imaging. The book covers choosing monitors, printers, and scanners; editing with the most popular programs (including Photoshop and Hijaack); using Kodak's PhotoCD; and dealing with service bureaus.



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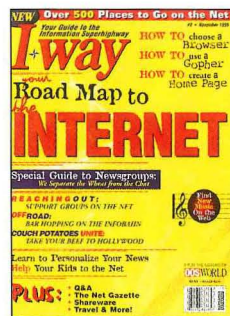
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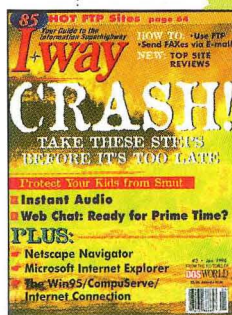
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